INTERNET COMMUNICATION AND PRACTICES OF SCIENTISTS IN THE ACADEMIC WORLD

An Intercultural Approach

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vorgelegt von
Ingrid Bergner
aus Krems an der Donau (Österreich)

Betreuer: Prof. Dr. Theo Bastiaens
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Summary

Scientists have been faced with constant and rapid increase in the use of digital information and communication technology in the scientific field and universities respectively within the last three decades. Accordingly, the basic assumption of this study is that professors in academia have been experiencing transformation processes concerning their habitus and communication patterns as actors within scientific fields due to integration of online communication tools into their professional activities.

My qualitative research study in form of exemplary case studies with 17 scientists from three geographic areas - Austria, Canada (Quebec) and New Zealand - was inspired by some ideas of the French philosopher and sociologist Pierre Bourdieu, especially his concepts of “habitus” and “scientific field” are well suited tools to investigate the transformation processes of the habitus, already existing and changing patterns of communication as far as the professional practices of scientists are concerned.

The analysis of the interviews showed some essential differences in online behavior of scientists especially in personal email management, web presence and using online tools as far as collaboration, teaching and scientific reputation are concerned. On the one hand there is a group of scientists, mostly people of the older academic generation already in top positions at university, who are faced with severe difficulties in adapting to and using online tools in their professional activities. But on the other hand there is a group of scientists who have already adapted to and have effectively integrated these new tools gradually into their practices as scientists and researchers though to different degrees. These two main groups which I defined as “Laggards” and “Shifters” are contrasted within the two poles of the “Enthusiasts” who intensively use all kinds of online tools and the “Dinosaurs” who, close to retirement, totally resist these tools and even do not engage in personal email management.

Online tools are already used as fighting tools for career building by the “Enthusiasts”, they keep their web presence very high and thus predominantly engage in digital publications, personally keep websites, even maintain a personal blog in some
cases in two languages. In contrast, “Shifters”, “Laggards” do not regard online tools as fighting tools for career building, but use some online tools to facilitate their work.

Moreover, the qualitative analysis of my interviews revealed that the degree of using online tools is not a language based problem but rather a problem to overcome technical difficulties and time pressure. English, the Lingua Franca of the net, naturally used by English-speaking native scientists only plays a minor role for those scientists who are English-speaking non-natives. Referring to teaching methods “Shifters” and “Laggards” in contrast to “Enthusiasts”, who predominantly engage in online teaching, mainly deal with traditional forms of teaching since face-to-face contact with students is very important for them. Some engage in both traditional and online teaching, some integrate small online units and others like the “Dinosaurs” use traditional teaching methods only.

An overall conclusion of this study is that implementation of online communication tools has already strongly impacted the working conditions of scientists in the academic world. Most of the professors belonging to the old academia are faced with the problems of transitional stages when integrating online technology. Some of them have already turned into “Enthusiasts” naturally dealing with technology and its implementation while “Laggards” are still struggling to overcome technical difficulties, time or group pressure. Contrary to the “Shifters” they still lack competence for critical reflections on effectively using these new tools for their professional practices.
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1. Transformation Processes in Academia

1.1. Research Questions, Presumptions and Concepts

Constant and rapid development, dissemination, implementation of digital information and communication technology at universities impact the habitus of professors of the academic world and cause major changes for their working conditions as scientists and researchers. Accordingly, my main presumption was that professors in academia are faced with transformation processes concerning their habitus and communication patterns as actors within scientific fields due to integrating online communication tools into their professional activities. My hypothesis in this respect was that the Internet and the World Wide Web not only cause transformation processes on behavioral patterns, practices and existing patterns of communication used by the academia within scientific fields but also result in the generation of entirely new communication types and practices.

In this respect I presumed that predominant traditional structures in the world of academia have been newly restructured due to the mechanisms of the Internet and the World Wide Web. Adapting to these new structures requires certain capabilities, practices and thus leads to behavioral changes of scientists, especially those belonging to the “old academia” since they have been socialized in the non-digital world and thus have to adapt to the new structures caused by the Internet and the World Wide Web.
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Professors in academia, the main focus of my research study, are members of the academia who are confronted with, influenced and shaped by a new culture I want to define as net specific culture. What do I mean by the term net specific culture? Information technology has introduced new types of codes, rules and patterns of practices and thus has been shaping the habitus of social actors using entirely new tools in their fields. These new rules, codes and practices have already been incorporated by people born into the digital world, they are well adapted to the net specific culture by nature, they implicitly use the new codes, rules and practices as it is part of their individual and collective habitus.

Professors of the academic world socialised in the non-digital world, and occupying a dominant position in the field of science, I assume would tend to conserve the practices and strategies they used for gaining top position in their fields. Due to implementation of technology they must or are required to adapt to the net specific culture of the digital world, that is to say, that they have to become digitally literate, acquire knowledge in operating online technology, learn and adapt to the rules and codes for communicative behavior to effectively interact with others using the web for professional and personal purposes.

At the same time they individually approach and deal with this net specific culture according to their personality features, experiences with online tools and their historical, individual habitus. In contrast the younger academia has already been socialized with the Internet and the World Wide Web; rules and codes of the net specific culture are incorporated and used as implicit knowledge when operating and dealing with online tools in their professional, scientific environment.

Moreover, I assumed that online tools provided by the Internet and the World Wide Web are already used as sort of fighting tools or strategic tools for gaining reputation and career building and that these transformation processes impact the habitus of scientists respectively lead to new types of behavior acting within scientific fields.

As I have already pointed out above, I concentrated on professors in academia since they, belonging to the group of the older academia, have not yet incorporated the net specific culture and thus demonstrate different individual transformation processes when shifting from traditional communication tools to online ones. According to their top positions in their fields they are not required to totally or partially
adapt to online tools in order to build up a career as a scientist and researcher in their fields. On the one hand it is their individual choice whether and to what degree they explore and finally implement online technology into their practices as scientists and researchers. But on the other hand, pressure from other actors in the field of academia and the growing importance of electronic communication tools for professional communication activities I suppose is very likely to rise for them.

At the same time they play a critical role in the diffusion of technologies. In this respect Nentwich (2003), for example, points out that “there are ‘passive’ people who only use what is available and what they are forced to, and that there are ‘activist’ researchers who actively explore the new opportunities. Furthermore, experiences with the past co-operation will impact whether an individual is likely to engage in new collaborative endeavours, in case they are not absolutely essential for the type of work s/he is carrying out”. Accordingly, he states that “these individual factors account for variation in usage” and that “it seems likely that if the overall trend is different from what individuals (or groups) prefer, the individuals will have to adapt in the long run” (Nentwich 2003:43-44).

Therefore my basic interest was to find out in which ways existing practices of professors in academia are shaped and transformed by the Internet and the World Wide Web, which new practices are generated by these online tools and how their traditional and historical habitus respectively impact the development of new practices and the transformation processes. What kind of practices do they develop when faced with the Internet and the World Wide Web? Do they already show habits or routines of behavior that are repeated on a regular basis and already tend to occur subconsciously which means without directly thinking consciously about them?

### 1.1.1. Digitally literate — digitally illiterate / digital natives — digital immigrants

At this stage I want to clearly point out that I did not intend to base the analysis of the interviews of my study participants and final description of the impacts on habitus and resulting changes on the grounds of personality psychological theories
concerning their personality features. In this respect I decided to differ between two groups of academics as far as usage of electronic tools and, closely related, the degree of digital literacy versus digital illiteracy is concerned:

- Digitally literate academics I refer to as digital natives in my research study
- Digitally illiterate academics I refer to as digital immigrants in my research study

Both terms digital immigrant and digital native coined by Mark Prensky (2001) are used in my study but more in the context of digital literacy and not in the pure context of immigration and native. I called one group digital immigrants because they are indeed entering a new territory (like immigrants do) imposed by the net specific culture of the Internet and the World Wide Web. That means that they have to learn to implement electronic tools into their daily professional routines from scratch and pass several stages of acquisition I referred to as “digital language”. Contrary, digital natives have already incorporated the “net specific culture” and habitually use its codes and rules without consciously reflecting their practices anymore.

1.1.2. English as Lingua Franca of the Web

I aimed to investigate individual behavioral patterns, practices and differences in dealing with online tools, compare these and finally draw conclusions on transformation processes scientists are faced with. In this respect I anticipated and supposed possible intercultural differences and decided to carry out my research interest in three different geographical areas. Austria, Quebec and New Zealand. One of the issues raised in this aspect was the assumption that misunderstandings are likely to arise when scientists, as members of the older academia belonging to different cultures engage in online communication activities. In this respect three main reasons were taken into account from my personal perspective:

- English has turned into the Lingua Franca of the web and for this reason asymmetric communication as it takes place when native speakers of English, for example, communicate with speakers of different languages — non-native speakers of English — misunderstandings very likely occur.
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• Speakers of different first languages communicate in English as Lingua Franca (ELF). English in this respect functions as “a ‘contact language’ between persons who share neither a common native tongue nor a common (national) culture” (Seidlhofer 2005:339). I assumed that this special form of communication using ‘contact language’ may lead to misunderstandings.

• Online communication causes misunderstandings for two main reasons: in the first instance, digitally literate people engaging in communication processes with non or less digital literate ones and in the second instance, technology based problems leading to misunderstandings.

1.1.3. Habitus and Scientific Field

My research study was inspired by some ideas of the French philosopher and sociologist Pierre Bourdieu (1991; 1992; 1998; 2005; 2007). From my point of view especially the concepts of “habitus” and “scientific field” are appropriate concepts to describe these transformation processes and impacts on communication patterns concerning professors in academia as scientists and researchers.

Habitus is an old philosophical concept where “the roots … are found in Aristotle’s notion of hexis, elaborated in his doctrine of virtue, meaning an acquired yet entrenched state of moral character that orients our feelings and desires in a situation and thence our actions” (Beckert and Zafirovski 2006:317). Later on the Aristotelian term hexis was translated into the Latin word habitus by Thomas von Aquin in the 13th century and “acquired the added sense of ability for growth through activity, or durable disposition suspended midway between potency and purposeful action” (Beckert and Zafirovski 2006:318).

Some time later the term habitus changed to habit in the sense of a permanent disposition. Continuous repetition during learning, for example, generates habits. According to Norbert Elias (1997; 1998) these automatisms not only work on the individual level but on the cultural level as well (cf. Fröhlich 2009:111). According to Krais and Gebauer (2002) Bourdieu describes the term habitus as a generative principle. This means that the habitus is not inborn. It is acquired through the practices of the actors, their social interactions with each other and the environment.
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Summing up, Pierre Bourdieu’s concept of habitus is a set of socially acquired dispositions, a mental framework that generate perceptions and practices.

According to Bourdieu, science constitutes itself as social field. “Science is a social field of forces, struggles, and relationships that is defined at every moment by the relations of power among the protagonists” (1991:3). Loïc Wacquant provides us with a more detailed description of what Bourdieu calls a field:

• “A field is, in the first instance, a structured space of positions, a *force field* that imposes its specific determinations upon all those who enter it. Thus she who wants to succeed as a scientist has no choice but to acquire the minimal scientific capital required and to abide by the mores and regulations enforced by the scientific milieu of that time and place.

• “In the second instance, a field is an arena of struggle through which agents and institutions seek to preserve or overturn the existing distribution of capital (manifested, in the scientific field, by the ranking of institutions, disciplines, theories, methods, topics, journals, prizes, and so on): it is a *battlefield* wherein the bases of identity and hierarchy are endlessly disputed.

• “Fields are historical constellations that arise, grow, change shape and sometimes wane or perish over time. In this regard, a third critical property of any field is its *degree of autonomy*, that is, the capacity it has gained, in the course of its development, to insulate itself from external influences and to uphold its own criteria of evaluation over and against those of neighboring or intruding fields.

• “A field structures action and representation from without: it offers the individual a gamut of possible stances and moves that she can adopt, each with its associated profits, costs and subsequent potentialities.

• “Position in the field inclines agents towards particular patterns of thought and conduct: those who occupy the dominant positions in a field tend to pursue strategies of conservation (of the existing distribution of capital), while those relegated to subordinated locations are more liable to deploy strategies of subversion. Established members have a vested interest in preserving the
existing order and criteria of judgement, new entrants and interest in challenging them” (Wacquant 2007:268-269).

Habitus and scientific field, these two notions of Bourdieu, influenced my research question(s):

- In which ways do online tools provided by the Internet and the World Wide Web change the habitus of scientists?
- May the Internet and the World Wide Web be used as new fighting tools for career building for scientists?
- Which transformation processes of online communication behavior of scientists are already visible?
- Which new types of communication and behavior patterns are created due to using the Internet and the World Wide Web?

1.2. Methods and Research Study Procedures

As far as my scientific procedures are concerned I wanted to make the typical changes and transformation processes concerning the habitus as well as communication patterns of scientists explicit, categorize and describe them and finally draw conclusions out of these by focusing on case studies following the guidelines and descriptions discussed by Lamnek on qualitative social research (1995). Therefore I exemplarily conducted my research study concentrating on 17 case studies from three geographical areas: Austria, New Zealand and Quebec. My primary intention was to carry out five case studies from each area but finally focusing on 17 interviews is based on two reasons:

- First, since two interview partners from Quebec are computer scientists I decided to find and conduct one more interview with a scientist belonging to a different field.
- The second reason was that I was faced with difficulties finding interview partners who totally resist using the Internet and the World Wide Web.
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The main reason for conducting six interviews in Austria was that carrying out the interviews was basically done using Skype for videoconferences or regular distant phone calls. In this respect it would have been (almost) impossible from my point of view to find a “dinosaur” type (briefly described as a person totally resisting the Internet and the World Wide Web, but this term will be explicitly discussed in Section 4.2). Scientists resisting online tools normally would not engage in conducting online interviews on the new media using online tools for lack of motivation, interest and technical knowledge. Finally, I succeeded in gaining an Austrian interview partner from the academic world due to recommendation and the possibility to carry out this interview face-to-face.

I collected empirical data by conducting narrative interviews with scientists and researchers willing to participate in my research study. What were the main reasons for carrying out these case studies focusing on narrative interviews as far as my research is concerned? The narrative interview as a special form of qualitative interviews is the most appropriate tool to investigate academics’ practices as social actors concerning online tools as well as integrating these into their professional activities within the academic field. During the process of narrative interviews academics are enabled to discuss, reflect and describe their practices, experiences, personal histories of acquisition of digital technology in a narrative form. According to Lamnek the structure of narrative stories closely relates to people’s patterns of actions (cf. Lamnek 1995:71). Habitus as a system of permanent dispositions expresses itself in routine activities which people are not always consciously aware. Therefore it seems that qualitative research like the analysis of my narrative interviews is very well suited to reveal these habits and practices.

All study participants were professors at universities and some had positions as vice chancellor or dean at the time when the interviews were conducted. Using the technique of narrative interviews I asked my study participants to respond to open questions on the integration, influences and impacts of the Internet and the World Wide Web in their professional lives. My interview partners were required to describe and reflect on certain aspects such as historical dimension, email behavior, websites and weblogs, videoconferences, chats and different types of discussion forum, online behavior, online teaching, digital publishing, scientific reputation and the Citation Index, language issues/language shift as well as personal evaluation of these online
tools. Language issues and language shift respectively as a main category were only dealt with academics from Canada since Quebec is a bilingual area and I wanted to find out whether they have already shifted to using English when communicating professionally via Internet and World Wide Web or still use both English and French or only use French.

The procedure of conducting the interviews was carried out in three ways. In Austria I interviewed the scientists and researchers in their offices face-to-face and recorded it at the same time. In contrast the interviews with study participants from universities in New Zealand and Quebec were carried out either by videoconferences or making long distance calls using the digital collaboration software [Skype]. Some scientists in New Zealand and Quebec preferred to be called and interviewed at home, others in their offices at the university. In order to record the interviews whether videoconferences or long distance calls I used the software [Call Recorder] an add-on for Skype that automatically recorded and saved the interviews on my Mac.

Searching for and finding scientists who were willing to participate in my research study was done by email request with scientists from New Zealand and Quebec, in Austria by visiting them during their office hours, calling them at their departments, personally asking at the end of a talk, for example, or in a few cases by email request, too. I did not focus on certain fields when searching for and selecting possible interview partners by visiting numerous websites of the universities in the geographical areas I had decided to gather empirical data in for carrying out my research study. Of course I focused on disciplines belonging to Humanities, Natural Sciences, Social and Economic Sciences as well as Technical Sciences to gain data on scientists and researchers belonging to different fields. But interestingly, most scientists who were willing to participate in my research study and gave an interview came from the Humanities, a few from the Social and Economic Sciences and Technical Sciences and only one from Natural Sciences.

Apart from the discipline, other criteria such as keeping personal websites or blogs or international collaborations and projects were reflected upon during the process of selecting interview partners. Finally, recommendations from those who had already agreed to give me an interview as well as other scientists were a further helpful source in finding study participants. All in all, it was quite time consuming to
find interview partners and make appointments for the actual interview for various reasons. Usually scientists have a very busy schedule as far as their professional activities are concerned and therefore it was difficult for them to find a date for conducting the interview. Some had to cancel the first appointment and postpone the interview to a later point of time. In one case there were technical problems using Skype for the videoconference. We tried it several times and finally we gave up. The reason for not being able to conduct an interview was not a digitally illiterate interview partner having severe difficulties operating online communication tools. Such a person would not have agreed on conducting an online interview in the first place. That interview partner to me seemed quite digitally literate according to his professional profile. In the end we did not manage to talk to each other due to technical problems with firewalling as we assumed at his university. A few gave me an interview right away. Most interviews were conducted in 2008, a few at the end of 2007 and the final one in 2009.

At this stage, I would like to mention that it was amazing and interesting for me that so many scientists holding top positions were willing to participate in my study on the basis of a simple email request in which I presented my research interest and briefly outlined the procedures for gaining empirical data. At the same time I had already started to maintain a personal weblog on research issues relevant for my study of research and therefore I provided the URL of my personal blog “Digitizing Science” [Bergner 2010] in my email request to provide my personal profile for those scientists who were interested. The goal of keeping a personal website rather was to gather information concerning my research interest than engage in scientific discussions with other scientists. When doing the analysis of all interviews I stopped maintaining it for some time to fully concentrate on my interviews and qualitatively analyzing these. Establishing contacts with scientists via email communication as well as online collaborations such as conducting interviews via videoconferences or long distance calls as in my case were already significant indicators for the transformation processes caused by online tools provided by the Internet and the World Wide Web.

Anonymity of all my interview participants was achieved by creating fantasy names. I decided on this technique of personal data protection in order to preserve the readability of my narrative. Whenever I mentioned one of my interview partners I used
these fake names, even in the reference list. Where it was necessary I changed biog- 
graphic details to preserve anonymity. References to countries or persons were ab- 
abbreviated with a single letter. Unfortunately, I also had to omit references to personal 
achievements and outstanding activities due to anonymity. Some of the citations 
therefore lose their special flavor of authenticity but it was unavoidable to guarantee 
anonymity. In many of the German interviews my study participants did not always 
use the correct gender sensitive forms. In my quotes of the transcriptions I corrected 
the masculine expressions to the gender sensitive style where appropriate. Litera-
ture and interviews are referenced with round brackets; electronic resources with 
square brackets. In the bibliography literature and web addresses are sorted in dif-
ferent lists.

1.3. Analysis and Evaluation

The primary goal of my qualitative analysis of the collected empirical data was to 
discover, analyze and describe existing, already transformed patterns of communi-
cation behavior as well as still ongoing transformation processes scientists are ex-
periencing due to the Internet and the World Wide Web. After transcribing the in-
terviews to an appropriate level of detail and checking the transcripts against the 
recordings for accuracy, I organized my data into meaningful groups by coding rel-
evant data extracts, paraphrasing these, drawing general conclusions, reduced and 
evaluated these and finally described relationships across my categories. I used a 
table for cutting, sorting and coding in order to identify patterns and connections.

The first part of my qualitative analysis procedure was to separately analyze each 
interview first and thoroughly describe the individual communication patterns and 
transformation changes in their behavior based on the main categories that will be 
explicitly discussed later on in Chapter 2. This was followed by a total analysis of 
all interviews in order to be able to analytically compare and describe the data of all 
study participants. Coding and analyzing the empirical data was carried out on the 
basis of Mayring (2002), but slightly adapted as shown in Appendix D.

As far as the comparison of all interviews is concerned I evaluated the main cate-
gories and their subcategories in form of a table by using a system on intensity and
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frequency the categories appeared in each interview. The grading system itself is shown in Appendix B.
2. Analysis of Interview Data

In the following chapter I am going to comparatively discuss the main categories of my research study on the basis of narrative interviews I conducted with scientists from three geographical areas. As far as the qualitative analysis of my study is concerned I generally differentiate between the following main categories and their subcategories: Personal history, email behavior, website and weblog, videoconferences, chats, types of discussion forum, online behavior, online teaching, digital publishing, scientific reputation, personal evaluation and finally language shift. The last category called language shift is only applied to the group of study participants from Quebec Canada. I integrated this category into my analysis to focus on possible cultural differences as Quebec is a bilingual area in Canada. Since the categories personal history, personal evaluation and language shift will be explicitly discussed later (see: in the chapter on study findings) I will concentrate my description on the remaining ones.

2.1. Email Behavior

2.1.1. General Description

The qualitative analysis of my research study shows that almost all scientists have totally shifted from traditional communication tools to electronic ones as far as email communication is concerned. Email is used as basic medium for professional and personal communication. There exists a small group of scientists who resist using email or engage in rare usage. Actually it was rather difficult for me to find a scientist who was willing to give me an interview on his/her usage and personal experiences
on online communication tools but who at the same time (almost) totally resisted using them. Finally and thanks to personal contacts one person agreed to give me an interview. I assume that one of the main reasons why scientists resisting implementing online technology in their professional lives are not willing to talk about it in public is that they do not want to out themselves. For this reason, they prefer to cling to their traditional communication tools and engage in total delegation concerning email communication as well as usage of electronic communication tools. But due to obviously constantly rising group pressure and rapidly advancing technological development I assume that this small group of scientists will very likely disappear in the near future.

Concerning email behavior I focused on the following categories and subcategories respectively: Basic medium, public access, number of emails a day, spam filters, personal management, filing management, piling management, delegation, frequency checking mailbox, mail reporting system, following Netiquette rules, time consuming, entertainment, collaboration.

Email communication has strongly impacted scientists’ communication patterns as well as their working conditions for it has turned into the most intensively used online communication tool. Most scientists have totally shifted to email correspondence from writing letters, sending faxes or making phone calls. “Email is definitely the medium through which I work and communicate”, argues Winter (2008). Others like Kurt Liebminger refer to the combination between Internet and email as the main source for structural changes. “Die Kombination von Internet und E-Mail ist wahrscheinlich die Kombination, die am meisten strukturelle Veränderungen mit sich gebracht hat” (Liebminger 2008). Moreover, he adds that due to the fact that email correspondence has become the basic medium for professional communication in and outside university Internet access and public access to email addresses are considered basic requirements for scientists. “Ohne E-Mail Anschluss ist man tatsächlich nicht mehr adressierbar. Das ist mittlerweile zu einer Selbstverständlichkeit geworden”, argues Liebminger.

Due to online communication tools provided by the Internet and the World Wide Web such as [Google] or other search engines, official and personal websites or weblogs, email addresses of scientists can be accessed publicly worldwide. Searching
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with Google for information on a scientist, for example, one realizes that his/her email address is “published in many places”.

Public access to a researcher’s email address enables and facilitates rapidly establishing first contact, starting and continuing collaboration like I did, for example, for my research project with my interview partners. In contrast public access presents an impact factor on steadily rising quantity of incoming emails. Shifting from traditional communication tools to email communication has generally resulted in a steadily rising number of emails. Maier, referring to email communication as one of the major changes caused by online technology, argues as follows: “Das eine ist E-Mail, was wir sicherlich alle am meisten merken. E-Mail ist ca. 20 Jahre alt und die Bedeutung, die es heute hat ist, dass wir von erwünschten und unerwünschten Mails überschwemmt werden” (Maier 2007). Today scientists get swamped by mails and therefore need to develop certain strategies to deal with this high quantity of incoming mails effectively.

What are the main causes for this steadily rising quantity of emails scientists have to deal with? Several reasons can be taken into account. First, email technology has increased communication globally and thus the number of incoming mails. Denver, for example, argues that email technology caused an increase in global communication for the last fifteen or twenty years. “I have noticed that there is a lot more of communication now between people than there was fifteen or twenty years ago. And that’s pretty much in terms of email anyway” (Denver 2008). Second, email communication is used for collaborations in projects on both national and international level. Third, facilitation of exchanging work files as mail attachments. Fourth, membership in mailing lists and distribution networks. In this respect not only shifting from traditional forms of communication such as letter writing, making phone calls or sending faxes contributed to rapid growth of global communication, but also distribution networks increase the demand on communication. According to Denver membership in distribution networks would increase global communication, too. He belongs to several distribution networks and so he would get a lot more of communication with a wider variety of people. Fifth, there exist floods of spam mails.

Email communication has developed into a highly used and effective tool for collaborative work concerning research and scientific work. Most interview partners
report on email communication effectively used for global collaborations such as research projects, writing articles or books on scientific issues. “I’ve done a lot of collaborative work over emails and I have written books with co-authors where communication has been over email” argues Irving Winter in this respect (Winter 2008). Worldwide collaboration with other researchers, writing books, papers, articles with co-authors are often done entirely via email correspondence. Email as an asynchronous communication tool, which means that people do not need to work simultaneously, is the most appropriate tool to effectively overcome different world time zones when collaborating internationally. Once the arrangements are set and the project management structure plan is finalized researchers, project members or co-authors work individually on their issues in every part of the world.

Matthew Denver refers to an example of a research project entirely carried out via email communication. Though he has never personally met the researcher he collaborated with, project development, data collection, data analysis in form of a statistical analysis were carried out very successfully. Finally they wrote and published two papers as a result of that. “I have never met this person. I have never talked with her. It was all done by email communication” (Denver 2008). Moreover, he pointed out that their similar types of communication styles and patterns had a great impact in successfully carrying out that project entirely via email correspondence. In a few other cases of entire email cooperation the result was not efficient and less successful for collaborating people did not use email the same way as he did. One person, for example, rarely checked his emails and there would be no response for weeks. But in several other international research consortia he is a member of email communication works well. From his personal experience effective and highly successful email communication obviously requires people using a technology as well as using it fairly regularly. Additionally, there has to be some sort of compatibility concerning communication styles and patterns. Due to lack of body language email communication can lead to a lot of cases of misunderstandings and resulting conflicts are very likely to rise (Denver 2008).

Which factors are important to successfully engage in research project collaborations based on email communication? First of all compatibility of certain factors such as communication styles, technological tools and their usage as well as working styles play a critical role in effective collaboration entirely carried out via email corre-
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spondence. Not only lack of body language may cause language problems and mis-
understanding but also unclear, not properly defined roles and work tasks of project
members. Moreover, different working styles, cultural differences and low command
of the “Lingua Franca of the net”, which is English, may impede project development
and influence work results negatively. Finally, integration of face-to-face elements in
virtual collaborations is necessary, especially when people start working together for
the first time. In this respect some of my interview partners commented on the im-
portance of regular face-to-face meetings in international research work in order “to
sustain a project and to restore confidence” (Winter 2008). I am not going into fur-
ther details on the importance of integrating face-to-face meetings when operating
with electronic tools for I will discuss it explicitly in Section 2.2.4.

Generally the transformation process caused by the shift from traditional forms of
communication to online ones is not a straightforward one from Denver’s point of
view, but has made a huge difference to him. In the old days international collabora-
tion was facilitated by attending international conferences and spending some time
at other institutions during sabbatical leave, for example. Today, he argues, you do
not have to leave home to take a sabbatical. Actually, he can do it as effectively or
even more effectively from his office where he can communicate with people world-
wide enabled by tools such as email communication (Denver 2008). Additionally,
technology has a deep impact on people’s types of interaction increasing the amount
of communication and thus may result in an overload of communication or infor-
mation. In this respect, Denver refers to a “potential downside as you get too much
to keep up with it” (Denver 2008).

Email technology playing such a dominant role in scientists’ professional lives has
led to both advantages and disadvantages. On the one hand email correspondence
facilitates communication and enables fast, instant and almost synchronous reac-
tions but on the other hand it results in mail floods, time pressure as well as pressure
of expected instantaneous reactions. For these reasons chances are high to over-
look some really important mails when personally managing, for example 100–200
incoming daily mails. Liebminger regards this as major disadvantage and reports
on the development respectively existence of a counter-trend at his department.
“Der größte Nachteil ist natürlich, dass die wichtige Nachricht in der großen Anzahl
unwichtiger Nachrichten untergeht. In meinem Bereich kann ich die Beobachtung
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machen, dass es einen gegenläufigen Trend gibt. Wirklich wichtige Botschaften werden entweder doppelt versendet als E-Mail und als Brief oder wieder überhaupt nur mehr als Brief” (Liebminger 2008).

Email communication has increased the workload of scientists not only because facilitation to engage in international projects, collaborations, global communication but also because it has turned into the basic medium for professional and personal communication within and outside university. In former days correspondence issues, for example, were done by secretaries while today scientists are required to personally manage increasing quantity of mails and administrative issues. In this respect email communication impedes a scientist’s work for he/she is required to do tasks that are normally not part of a scientist’s professional expertise. “Im Grunde hat E-Mail dazu geführt, dass man sehr viel an Kommunikationsverkehr, den man früher über das Sekretariat und dergleichen mehr abgewickelt hat, jetzt selber abwickelt. Das ist ein Nachteil. Man ist als Wissenschafter bzw. Wissenschaftlerin ja nicht dazu angestellt E-Mailverkehr zu machen” (Liebminger 2008).

2.1.2. Personal Management

Scientists have to process a large number (on the average 50 to 100) of emails every day since email communication is essential in their daily work. Nowadays email technology playing such a dominant role concerning communication and collaboration has thus influenced scientists’ behavior and communication patterns in certain ways. In this respect I am going to discuss the following questions in order to describe the transformation processes scientists are faced with due to the mainly used electronic tool, email correspondence. Which techniques are applied to effectively manage a large number of incoming daily mails? Which different methods of managing emails are likely to be used by scientists?

Instant personal management presents the most frequently applied technique. Accordingly, there exists high frequency of checking mailboxes for incoming mails as well as usage of mail reporting systems. Generally usage of mail reporting systems is not regarded a highly critical factor but is integrated into email management to
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various degrees. Some scientists prefer to keep it switched off most of the time during their working hours while others simply do not bother about this software feature announcing mails considering it as a source of distraction. They prefer to have control of themselves by regularly checking incoming mails. Matthew Denver, for example, has never bothered activating this software feature. He prefers to control himself by checking his incoming mails on a regular basis in order to protect his personal time budget and does not use a mail reporting system (Denver 2008).

Reading, processing and managing mails presents a source of distraction for most of the interview partners who participated in my research study. For this reason operating and activating an email reporting system leads to a higher degree of distractions and impediment on scientific work. For Simon Lenz an email reporting system results in a high degree of impeding his work as a scientist which he critically reflects upon as follows: “Ein E-Mail Meldesystem ist teuflisch. Man kann administrieren, aber wirklich denken, am Stück arbeiten und dann eine E-Mail Meldefunktion haben, das kann man wirklich gleich vergessen. Das habe ich mir abgewöhnt, d.h., wenn ich intensiv dran bin, schalte ich es normalerweise schlicht und einfach aus. Im Büro gibt es irgendwie wohl noch ein Zeichen aber das sehe ich normalerweise nicht. Daheim könnte ich es akustisch machen, aber da schalte ich es üblicherweise aus” (Lenz 2007). Liebminger and other interview candidates would turn off mail reporting system or simply ignore it when focusing on research work. “Im Prinzip habe ich so ein Meldesystem. Wenn ich dann konzentriert arbeite, schalte ich es entweder aus oder ignoriere es. Ich reagiere dann nicht mehr darauf” (Liebminger 2008).

In contrast, some keep it on most of the time and would only occasionally switch it off, mostly on weekends. Dennis Morrison demonstrates high frequency of checking his mailbox. He checks his mailbox at least once an hour. Whenever leaving for a coffee, he would immediately check his mails after his return. The reasons for this high frequency are as follows: usually there are many things running on deadlines. Then email is first place of contact for family members. Moreover, a lot of his friendship is online as he is a cosmopolitan kind of deracinated in some way. “I am very kind of deracinated in a way. I was born in S., lived in L., I worked in the US, I spent ten years in A. and ten years in New Zealand. A lot of my friendship network is online”, states Morrison (2008). Using an email reporting system is closely related to the intense frequency of checking his incoming mails. It is on most of the time as he
uses it to notify him meetings. But occasionally he would turn it off as he checks his mail regularly.

Some regard it as a nice-to-have tool or as some type of toy to play with and thus do not really pay attention to. In this respect Müller-Mandl, demonstrating high frequency of checking mailbox for incoming mails and using a mail reporting system, mentions that it presents no important tool for her but rather functions as sort of entertainment. “Ich habe ein E-Mail Meldesystem, doch es ist nicht wichtig für mich. Es ist ein interessantes, lustiges Spiel” (Müller-Mandl 2008).

Frequently and regularly checking mailboxes has already become a daily routine for my interview partners dealing with personal mail management. Individual methods vary from checking every hour, during breaks, several times a day or every other day. Basically they check in the morning before going to work or it is the first activity in their offices, they would check during breaks, in the evenings and finally late at night. Denver, for example, personally manages his incoming mails by regularly checking mailbox and deleting trash and spam mails right away. “I do check it regularly. The program I typically use is that I check it first thing in the morning. That might take me half an hour. Sometimes a bit longer, if I have to respond to things. I check it again after lunch for half an hour maybe” (Denver 2008). Most prefer to engage in offline periods on the weekends or in the evenings because they want to withdraw from the Internet and processing mails to protect their personal time budget. During these periods they occasionally check their mailboxes unless there is something very important to deal with such as collaboration issues, interaction with full time or part time working students to discuss papers and provide support on their scientific work. In case they are out of office during the day or abroad participating in conferences they would check in those periods they would normally go offline, weekends, evenings, late at night to see if there is anything to deal with.

Reserved periods of time for processing mails present a further strategy scientists prefer to use. In contrast to the advice of management guru Julie Morgenstern “Never check your E-Mail in the morning” (2005) John Sellers and some others refer to regular frequency of checking mailbox(es) in the morning and instant personal dealing during a reserved period of time. “I check it in mid-morning. Most people go to work here at nine o’clock and the first thing they do is they answer their mails.
In my position now many of the reactions and answers have to be made the same day. So I reserve the time from 10:00 am to 11:00 am for answering my mails every working day“ (Sellers 2008). Since many students in Canada earn their livings by doing part time work, he has to make allowance to his students to actually communicate with him outside the classroom because many of them only have time during the weekend. These weekend collaborations are facilitated by the usage of email correspondence.

Accordingly, Kurt Liebminger demonstrates strict self-discipline and self-control dealing with incoming mails by applying the following methods. First of all he tries to respond within relatively manageable amount of time aiming to avoid pressure of instantaneous reactions. Secondly, he would reserve one to two hours a day for managing his mails. In this respect he refers to offline periods as highly critical factors for continuously doing research work. Like most other interview candidates he experiences incoming mails or usage of mail reporting system as sources of irritation. “Durch die Möglichkeit des Multitasking ist eine unheimliche Konzentrationsstörung gegeben. Ich muss mich noch und ich glaube jeder Wissenschafter bzw. jede Wissenschafterin muss sich konzentrieren. Konzentrieren heisst, sich weder durch Telefonate noch durch E-Mails stören zu lassen. Deshalb wird es immer Zeiten oder Tage geben, wo ich auf E-Mails nicht reagiere, weil ich etwas anderes zu tun habe”, argues Liebminger (2008). Additionally, he mentions that a huge number of incoming mails on events, symposia or readings one is not personally involved are taken notice of but may be ignored and deleted right away. The subject headline usually functions as an indicator for selecting important mails from unimportant ones.

Personally managing mails, scientists have developed certain strategies to deal with their messages effectively, to set priorities on incoming messages as well as getting rid of the unimportant ones. Most of my research study interview partners instantly personally dealing with incoming messages use filing management to filter unimportant mails and spam mails out of their inboxes. As far as spam mails are concerned most universities provide firewalls and centrally installed spam software to protect their staff from getting flooded by spam mails. Some universities use highly effective spam software so that spam mails are completely filtered out and thus scientists only have to deal with important mails that need to be answered. But there
are others providing less effective software on discarding spam mails. In this respect most interview partners use spam filters, some as many as they can have to select trash from mails they really want to deal with. As far as Winter’s personal email management is concerned spam filters select important mails from unimportant ones. Using spam filters reduces the number of mails to about thirty per day. Those in the spam will never be checked again and finally deleted. “Never check my spam. Mails in my spam are thrown off forever”, argues Winter (2008).

Implementing usage of effective spam filters instantly reduces quantity of incoming mails and thus facilitates the further process of individually managing one's incoming mails. In this respect Denver refers to using spam filters as an effective tool in order to immediately discard a lot of unimportant mails (Denver 2008). Due to the qualitative analysis of my study interviews generally there exist three types of methods in dealing with spam filters. First, those scientists who are provided with a highly effective centrally installed spam filter system at university do not have to bother with unimportant mails and trash in their inboxes as these are filtered out. For this reason they have to process and manage only the important messages that need to be worked on. Those are the lucky ones because they are well protected against invasion of spam mails and thus may start with important mails right away. Others like Thunder argue that spam mails form a major source for mail floods scientists are faced with. They need to be checked for important ones too, he states. Not checking his mailbox regularly results in an inbox overload and it almost takes a day getting rid of spam mails and dealing with those left personally (Thunder 2008). Finally, the third type uses as many spam filters as he or she may use but never pays attention to these messages again. They are deleted.

Managing mails simply is “pain” for some scientists. Being away for a week, for example, Thunder may not give an exact number of daily emails as he is “flooded” by incoming mails. According to his personal experiences there exist various sources for that mail flood most researchers today using the Internet and the World Wide Web are faced with. On the average day as all information at his university is distributed via mails now he receives quite a few circulates, messages that cannot be blocked. A lot of mails would come that way. Then about half a dozen mails would inform him on the activities in his school. Additionally there exists a lot of mail correspondence with students, particularly post-graduates attaching work, setting up
meetings and discussions. Accordingly, Thunder, like most interview partners, considers mail management time consuming experiencing stress, time pressure and even “pain” especially when dealing with all incoming mails personally. He considers email management a critical factor concerning living cost of researchers for globally affecting working conditions of these. From his personal perspective several arguments can be taken into account. He argues that managing mails influences the living cost as it is quite substantial and has become a daily task. So it presents a new dimension concerning working conditions of the average researcher these days. Researchers today, for example, are supposed to manage all on their own. In the past they used to have people who would type papers, draft letters, for example (Thunder 2008).

Once scientists have decided to keep a message they also have to decide what action to carry out on it. Whether and when they are going to reply to it. What kind of processing strategies they want or need to use on the remaining messages. This decision-making process is closely related to one of the relatively young research fields called PIM. PIM stands for “Personal Information Management” and is defined as follows: “PIM is both the practice and the study of the activities people perform to acquire, organize, maintain, retrieve, use, and control the distribution of information items such as documents (paper-based and electronic), web pages, and email messages for everyday use to complete tasks (work-related and not) and to fulfill a person’s various roles (as parent, employee, friend, member of community, etc.)” (Jones and Teevan 2007:3).

Instantly personally managing and processing incoming mails requires two distinct kinds of activities: information keeping and information organizing. According to William Jones decisions referring to information keeping can range from total ignorance to keeping them in a special place. The first decision focuses on the aspect “ignore, this has no relevance to me”. The second decision closely related to the first one “ignore I can get back to this later (by asking a friend, searching the web, or some other act of finding)” and finally “keep this in a special place or way so that I can be sure to use this information later.” Information organizing may be guided by the following questions: “How should items in this collection be named? What set of properties make sense for and help to distinguish the items in this collections?
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How should terms within this collection be grouped? Into piles or folders?” (Jones 2007:39)

Whether the information is stored in a special structure of folders or in one bunch splits people into filers and pilers. Filers are the ones who store or file information into specific folders labeled subject related whereas pilers prefer to rather loosely collect their personal information into one heap or pile. Research shows that most people prefer filing information. This is confirmed by my research data as all my interview partners as far as emails are concerned are “filers”.

This is insofar interesting as in the electronic age labeling data additionally does not make sense anymore because one can immediately find digitized data with search engines by their content. In “Everything is miscellaneous” David Weinberger characterizes this powerful opportunity of the “new digital disorder” (2007). Moreover, creating and labelling a folder structure has enormous disadvantages:

- Creating and labelling folders is time consuming

- To find old information one has to remember in which folder the file was stored

- Sometimes mails do have information which could be logically stored in various folders at the same time. In this respect either one has to make a decision in which folder to store it or copy it and archive both files

- Over time one works on different projects and therefore the labelled folder structure has to be adapted

My interview partners do not vary greatly in their approaches on keeping and organizing emails. All of them demonstrate filing management as far as further processing of mails is concerned. They would use sets of files reasonably organized especially for filing emails with rather long documents attached. It seems that it is more convenient from a psychological point of view to store things into small and clearly defined units assuming that this information can be found more easily later on. But according to Weinberger and Jones this assumption is wrong in the digital age (Jones and Teevan 2007; Weinberger 2007).
In this respect Thunder comments: “I do file stuff. I have sets of files reasonably organized. I would scan through and put things in files and then deal with them”. Moreover, he refers to a strong tendency to filing for he dislikes reading long documents on the screen. Filing short emails are not considered necessary. “I tend to put a lot of stuff off and file it because I don’t like to read long documents on the screen. I wouldn’t do that for email letters, you know, short ones I think” (Thunder 2008).

Daniel Luchard receives about forty daily mails that are not part of mailing lists. He uses filing management to filter unimportant mails and spam mails out of his inbox. Dealing with his mails mostly personally he spends an hour or less every day on emails. He argues that he is aware of the dangers of distraction caused by emails as people easily get trapped in spending more time on it. In order to minimize time dealing with these forty mails he archives them by using [Google Gmail]. “I would use Google mail and I just click on archives. And they get archived automatically. So they use up very little of my time” (Luchard 2008).

Since email communication is very central for him, he engages in instant dealing with incoming mails applying the Inbox Zero Technique, a derivate of Getting Things Done (Allen 2002), a productivity scheme. The basic idea of this technique is to keep his inbox empty all the time. So when he receives an email, he instantly does some action to it. This type of mail management is very important for him as he communicates with his students almost entirely through email.

Some scientists mainly engaging in personal management when dealing with their incoming mails demonstrate preference to manage messages in “small units”. One of my interview partners, Jeff Farmer, argues that he generally checks his mails first thing in the morning at home and files those he needs to deal with. The rest he would read and basically leave them there and delete the ones he knows have nothing to do with him. The ones he may want to come back to, he would leave there. In this respect he demonstrates the tendency to spread up his day in what I would call “small email units” such as dealing with emails for some time at home in the morning and in the evening. “Quite often I look at my emails there and I answer. The students will send questions or they have queries or whatever. I can do that last at night or in the morning before going on” (Farmer 2008).
Accordingly, he refers to checking his mailbox probably about ten times a day as his portable computer facilitates and enables frequent checking and instant dealing with mails. Finally, once a month he puts down his remaining mails into his private box on his computer. Moreover, he uses a mail reporting system, but has not turned into an email freak. He would not answer incoming mails that are not urgent right away, for example. In this respect he demonstrates a strong tendency to apply his personal evaluation system on the urgency of dealing with incoming emails in order to avoid becoming a slave of email correspondence. According to this Farmer points out that “when something comes in, I am not someone who needs to answer straight away. I think what a lot of people do is to have the feeling because you get it instantaneously you have to answer instantaneously. When an email comes in, I evaluate its urgency first. Then I get back with respect to my own evaluation of urgency and not to the urgency of the person that sent it to me. Otherwise I would become slave to the whole thing” (Farmer 2008).

Jeff Farmer refers to himself as already being an email person not using his mobile and text messaging for professional communication and international collaborations. He needs to have permanent access to his mails for doing a lot of traveling due to international collaborations, giving talks in different countries. For him he argues high speed Internet is his working place for he needs to be in constant contact with his constantly working lab consisting about ten students, researchers and technicians. For these reasons he demonstrates intensive usage of [Hotmail] and Internet Cafés where he uses the [Internet Doctor] for downloading mails onto his computer. Concerning storage of mails Farmer uses both a central and a private system. Usage of [Outlook] setup so that whenever an email comes in it stays central and it also goes to his computer. Additionally, he refers to archiving and filing mails.

On the contrary other interview partners regard text messages as an effective strategy in reducing quantity of incoming mails. “I get far too many mails. There is one reason why I really like text messages on the cell phone. I mean it’s so easy. You get it anywhere, it is very short and people come to the point. You can reply wherever you are and you don’t have to get out your computer and find a wireless point”, argues the musicologist Peter Thaxter (Thaxter 2008). Moreover, he refers to archiving of some mails and at the end of the week or month he would deal with them deleting unimportant ones or trying to respond. Thaxter demonstrates regular frequency of
checking his mailbox arguing that he would check about “every other day”, though he admits that he avoids checking his mailbox as much as possible.

Most of my interview partners belong to the group of filers. What are the reasons for not engaging in piling activities when personally managing messages? Why do scientists prefer filing and archiving to piling? Some might pile some of their messages for a very short period of time but did not explicitly mention it during the interview. One of the main reasons from my point of view is that piling activities increase time pressure as well as quantity of emails in the inbox. A further argument is that scientists are very likely to forget about those piles of messages and thus prefer reasonably structured and organized folders with clear labels which can be quickly accessed, are visible and easy to re-find. Concerning piling of emails William Jones argues as follows: “The email inbox provides pile-like functions of accessibility and visibility, but these functions are clearly reduced as the number of items in the inbox increases and especially for messages that scroll out of view” (Jones 2007:43). Finally high degree of impatience as well as instantaneously expected responses are critical factors when dealing with email correspondence by most scientists. This could be another impact factor for not engaging in piling activities when dealing with email management because scientists apply their individual system of evaluating incoming email messages on urgency and thus need to instantly react to urgent matters.

Especially scientists and researchers holding positions at management levels at their universities such as dean of department, dean for studies or vice-chancellor need to engage in quick decisions when processing incoming messages. Usually these positions increase quantity of incoming mails to a higher degree. Morrison reports on the time when he was chair of his department, the number of incoming mails had increased (Morrison 2008). Additionally, Simon Lenz, in his position as scientist and dean constantly experiences pressure for immediate reactions and thus has already turned into a notorious quick respondent when dealing with email communication. “Ich bin ein berüchtigt schneller Antworther,” argues Lenz. Like most interview partners he reports that emails playing such a dominant role in professional communication results in impatience and expected instantaneous reactions. “Ich halte es nur schwer aus, sehr viele unbeantwortete Mails in der Maschine zu haben. Es gibt hier so eine Art Beschleunigungsfaktor wo ein Vielfaches von dem passiert wie wir es uns normalerweise gar nicht vorstellen können ohne diese Technik” (Lenz 2007). In this
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respect I draw the conclusion that researchers holding positions in administration and management at universities are faced with a higher amount of incoming mails than researchers without administrative tasks. Moreover, I assume that this is one of the main reasons for not engaging in piling. In order to avoid piling messages in their inboxes some would delegate mails more frequently than others.

2.1.3. Delegation

Apart from instant personal management most interview partners show preferences for delegation of incoming messages to various degrees. In the following I will discuss this second frequently used method looking at several factors that have particular influence on delegating mails to assistants, secretaries, team members and colleagues. Two of my interview partners engage in high frequency of delegating incoming messages. Interestingly both scientists demonstrate a totally opposing habitus in dealing with electronic tools provided by the Internet and the World Wide Web. The one making intensive use of online communication tools as well as experimenting with these while the other almost totally resists these tools due to various reasons.

Helmut Maier not only engages in personal management of mails but also demonstrates a high degree of delegation. Apart from periods of total delegation in the past he personally reads his emails but would delegate a huge percentage for further dealing to the right people at his department. “Selbst beantworte ich nur einen Bruchteil meiner Mails,” he states. As scientist, researcher and manager he has noticed that people holding positions at middle and higher management levels basically do not read any emails and delegate them to their secretaries. Only in case of important mails that have to be dealt with personally they would read the printed version of the email and provide their answers for the secretaries. In the past he himself periodically engaged in total delegation of mails, too. But finally he came to the conclusion that personally reading ones incoming mails is much more efficient than delegating them to other people. Moreover, he adds that there are always drawbacks concerning delegation because out of curiosity one would open even delegated mails when they come in, deal with them personally and thus waste a lot of time (Maier 2007).
In contrast to all interview partners, Paul Friesacher refers to total avoidance to use email as basic medium for professional and personal communication. Until recently he has been successfully fighting high quantity of incoming mails as well as only marginally engaging in email correspondence using the following methods. First of all he treats mails as subordinates. “Leute, die mich kennen, haben plötzlich zur Kenntnis genommen, dass es eigentlich der komplizierteste Weg ist mit mir über E-Mail zu kommunizieren”. Second, requests are expected in letterform. “Anfragen bitte möglichst in Briefform” information provided at the official website. People contacting him via email are required to send their requests to the general email address of his department since he does not want to make his email address publicly known. Third, no instantaneous responses provided and usually responding in letterform even when communicating via emails. Fourth, total delegation to his secretary (Friesacher 2009).

Friesacher demonstrates total delegation of mail management, checking mailbox for incoming mails, and dealing with them effectively to the secretaries’ office. He considers himself in a privileged position due to possibility of total delegation of his incoming messages. Moreover, delegation presents an ideal solution for a scientist who still regards traditional letters as the most effective professional communication tool. “Das bekomme ich praktisch ununterbrochen gemacht. Das Institut hat inzwischen auf meine Schlampigkeit reagiert und sie haben es ins Sekretariat gezogen. Das ist natürlich eine Lösung, die für mich ideal ist. Damit bin ich in meiner Position unglaublich überprivilegiert. Ich habe die Unterlagen täglich in gedruckter Version am Tisch. Ich reagiere aber nicht in der Geschwindigkeit wie es sich die Leute vorstellen” (Friesacher 2009). The following arguments are taken into account for consciously distancing himself from personal mail management. Increasing and intensifying lack of technical knowledge in operating online communication tools resulted in feelings of fear and torments. “Ich kann mit dem so schlecht umgehen, dass alles nur eine Quälerei wäre. Das hat sich natürlich auch verfestigt und ab einem gewissen Zeitpunkt ist man dann diesbezüglich so ein Neandertaler, dass es tatsächlich ein bissl Angst vor dem ganzen Bereich gibt” (Friesacher 2009).

According to my research study we can see that professors holding positions at university management level such as chancellor, vice-chancellor, pro-vice-chancellor or dean are engaged in numerous administrative issues and thus most of them show
a strong tendency for delegating mails to assistants or secretaries who demonstrate capability and competence to manage those forwarded mails effectively and efficiently. Those professors are constantly faced with an overload of incoming emails, some of them should be dealt with immediately as a quick decision is desired, for example, some can easily be passed on to someone else, and some have to be filed and managed respectively processed at a later period of time.

Total personal email management at that university management level even with filing and piling is simply not possible anymore and different types of delegation have to be executed. Some let an assistant deal with all mails first and ask to receive only the important ones one has to deal with personally like Jackson did in her position as a pro-vice-chancellor. In the past, as pro-vice-chancellor, an assistant dealt with incoming emails first and sent her only the ones he knew she wanted to see personally, whereas right now (date of the interview) as normal professor she is personally managing all her mails (Jackson 2008). Others have a quick look at all the incoming mails and delegate those of minor importance to assistants or secretaries or people in charge of project management. Annette Pongratz, for example, mainly engaging in personal management of mails would delegate mails to her secretary who is allowed to check all her incoming mails as well. “Ich versuche schon über das Sekretariat Dinge zu delegieren. Meine Sekretärin kann in alle meine Mails schauen. Ich will das auch, wenn ich unterwegs bin, dass noch jemand drüben schaut und mich darauf aufmerksam macht, ob etwas sehr dringend ist” (Pongratz 2007).

As I have already discussed before almost all interview partners do engage in instant personal email management and would only delegate a few ones. Müller-Mandl would delegate only a small quantity of mails to assistants. “Ein minimaler Bereich die K.-Studien betreffend. Dort habe ich zwei nette und technisch begabte junge Mitarbeiterinnen an die ich manchmal einen ganz kleinen Teil meiner Mails delegiere” (Müller-Mandl 2008). Apart from personally managing his mails, Liebminger engages in delegation of those mails that are not addressed to him personally but to the institute. “Ich kann eine bestimmte Kategorie von Mails delegieren. Mails, die nicht an mich persönlich gerichtet sind, sondern an die Institution. Diese Mails kann ich an meine Mitarbeiter und Mitarbeiterinnen, die dafür zuständig sind weiterleiten. Da ich aber in gewissem Grad in der Öffentlichkeit stehe, ist natürlich ein
2. Analysis of Interview Data

Großteil der Mails an mich persönlich adressiert. Das muss ich natürlich auch persönlich beantworten” (Liebminger 2008).

Peter Thaxter would delegate about 5-10 mails to two of his teaching assistants. One of them is responsible for doing his book orders, for example (Thaxter 2008). Luchard demonstrates mainly personal management and delegation of mails to support staff, when he manages a program such as the Master Degree in Information Technology. In this case students would be directed to the coordinator of the program (Luchard 2008).

Concerning mailing lists of national and international projects all mails are delegated to a contact person responsible for mail management as project leader or project assistant as in Winter’s case. Usually he works with emails right away, a habit that reflects his working style doing things right away or not at all. As far as delegation of email management is concerned he delegates only a few ones. Those rare exceptions are mailing lists for international software projects, for example, that are rarely read personally. He might look at them sometimes, but all that comes to him he deals with himself (Winter 2008). Mailing lists are of minor importance and can be easily delegated to staff members or other people involved in the project. Those people may inform their professors about certain matters or the ongoing process of the project and make quick decisions themselves depending on their level of responsibility for the project or project support. Moreover, I suppose that priority content usually is not sent via mailing lists.

In contrast Thunder, for example, demonstrates total personal management as, apart from assistants in research teams, he lacks assistants in his school he could delegate his incoming mails to. Apart from that he points out that delegating mails would even increase quantity of mails, for collaboration in research projects and research teams is already done entirely via email correspondence (Thunder 2008). Some scientists do not engage in delegation of emails at all. As far as email management is concerned Sellers demonstrates total instant personal dealing with all incoming mails. One of the main reasons is that there is no delegation of mails for he has learned in his life that unless it is an extremely competent and circumspect person you always have to double check and then you must do doubled work (Sellers 2008).
2. Analysis of Interview Data

2.1.4. Netiquette Rules

Do scientists follow and use certain Netiquette rules when professionally communicating via email correspondence? Which basic rules or code of conduct have they developed when shifting from writing letters to email as basic medium for professional and personal communication? Have they already adapted to using and integrating the so-called classic code of conduct dealing with electronic communication tools?

According to my study results I conclude that scientists as “digital immigrants” (cf. Section 3.1) have not totally shifted to the digital style of communication concerning email correspondence for professional activities in science. Most interview partners refer to the importance of using basic Netiquette rules when communicating via emails. Additionally, they prefer and still engage in letter writing style. Generally emails are written shorter than letters but courteously with opening, closing and writing content avoiding usage of chat language. Very rarely they would use abbreviations or emoticons to conclude or express emotions on certain issues. In this respect some refer to the difference between formal and informal emails. Dealing with informal emails some would not hold back with feelings of anger or emotions whereas in formal emails they would concentrate on the main issues and properly discuss them using basic Netiquette rules.

Following strict Netiquette rules is highly important for John Sellers when dealing with email communication. He always manages his mails courteously, starting with a salutation and addressing people by name. According to his personal and professional experience online communication is less reflected upon and presents a strong reduction of Netiquette. Basically two arguments for this lack of quality in communicating electronically are taken into account. Time pressure when composing and managing emails as well as lack of clearly identified legal status.

As far as time pressure is concerned Sellers argues that in the old days there was time to think and reflect on written correspondence whereas today one is expected to answer instantaneously. This time pressure on responding to mails may lead people to express things they wish they had not said especially when composing angry mails. At least in Canada this lack of clearly identified legal status of emails impedes
fighting offending and impolite messages especially for scientists holding an authoritative, administrative position. That makes communication very tricky causing difficulties in handling such offending mails for there is not enough time left to reflect on the response either. So one has to charge from case to case, Sellers argues and adds “that there are malicious people out there and that there exists identity theft” (Sellers 2008).

According to Lenz’s personal and professional experience, online communication is less reflected upon and therefore results in low command of language use as well as rising number of misunderstandings. Time pressure, when composing and managing emails as well as high number of incoming mails are referred to as the main reasons. “Gerade wenn man relativ viele Mails bekommt, merke ich wie risikoreich dies für den Kommunikationsprozess ist. Man differenziert nicht mehr in den Formulierungen, wie ich es möglicherweise in einem Brief tun würde, und ich habe schon öfter bemerkt, dass beim Empfänger bzw. der Empfängerin ganz etwas anderes ankommt als das was ich eigentlich sagen wollte. D.h. das Risiko für kommunikative Missverständnisse scheint mir exponentiell durch dieses technische Medium zu wachsen, weil man schneller antwortet, weniger reflektiert antwortet, nicht mal oder selten eine Nacht darüber schläft. Man kommuniziert hier zum Teil einfach erbärmlich” (Lenz 2007).

As far as Netiquette rules are concerned, Jackson generally differentiates between formal and informal mails. She partly follows Netiquette rules as it depends entirely on the person addressed to. Writing emails ranges from quite formal emails to the dean to very informal emails with poor punctuation and so on to closer colleagues. She would not use strict Netiquette rules in email communication criticizing colleagues, for example. “I don’t hold back in criticizing my colleagues. If I think I have been to some idiotic meeting, I tend to let rock fly” (Jackson 2008). Additionally, there is no necessity for strict Netiquette rules for her in email communication used for funny conversations with friends about what is going on. Generally we may say that following strict Netiquette rules when composing emails apart from formal and administrative ones is less important for Alberta Jackson, though sometimes she would get that “odd sense of anxiety” that mails might be “dredged up and used publicly”.

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Guilbert Lacroix follows basic Netiquette rules for most of his emails dealing with administrative problems and he would therefore use bureaucratic language keeping them as brief as possible. He tended to do that only with administrators and fellow professors. On the contrary he engaged in both formal and informal communication with his students due to lack of face-to-face meetings. In the past students registered by hand and with paper so he met every student at least twice a year. But now online registration causes total reduction of human contact with students and has shifted communication to using emails. For this reason Lacroix tends to write much longer emails trying to read and explain the problem (Lacroix 2008).

He continued that generally “letters obviously have a very different narrative style than anything you can use on the Internet. On the Internet I have noticed that we tend to have very brief communications and also less personal reflection. Moreover, there is a greater frequency of communication but blinder, more superficial, less personal and more restricted to business and immediate events” (Lacroix 2008). Most people are aware that the Internet is not secure for communication and therefore they demonstrate a strong tendency to using formal communication and avoiding informal communication such as describing one’s thoughts. In this respect Lacroix refers to “a change in orientation that has been caused by the sort of ubiquity of the Internet and its ease of access.”

Most scientists still engage in letter writing style concerning email correspondence. Farmer argues that his shift from writing letters to professional email correspondence has an impact on using Netiquette rules when composing emails. “I was brought up in a time when letter writing was an important tool. What you say to someone is temporary but what you write down is permanent” (Farmer 2008). He considers the following Netiquette rules important when composing emails. First, he reflects on content, corrects everything and then sends it out. Second, he makes sure that everything is expressed properly. Third, he would not use abbreviations to say something automatically. Fourth, he integrates elements of politeness when starting and finishing mails and finally critical reflections on content.

Additionally, Liebminger considers basic Netiquette rules very important and expects people interacting with him via email correspondence to apply these rules properly. Personally he prefers letter-writing style when communicating via email
2. Analysis of Interview Data


Lenz still uses letter-writing style when communicating via email, but shorter and rarely using concluding abbreviations such as “mfg” or “lg”. “Im Großen und Ganzen schreibe ich E-Mails fast noch wie Briefe. Schon kürzer, aber tendenziell rede ich die Leute noch an, tendenziell habe ich noch eine ganz normale Abschlussformel. Selten verwende ich “mfg” oder “lg” oder so irgendetwas” (Lenz 2007). Netiquette rules are considered important basic rules by Müller-Mandl, too. Generally, she keeps her emails very short due to time pressure and dealing with her mails mainly personally. “Fast drastisch kurz. Bis zu zwei Wörter E-Mails kann man von mir durchaus bekommen. Es ist schade um die Zeit und ich komme diesem Leistungsdruck nicht ganz aus. Ich habe das Gefühl da warten 50 E-Mails, die müssen schnell raus und ich möchte natürlich gerne eine Antwort geben, um dann frei für andere Dinge zu sein” (Müller-Mandl 2008). In the beginning she disliked abbreviations such as “mfg” and usage of emoticons or smileys but in the meantime she has adopted some and integrates these into her writings.

Some scientists consider following strict Netiquette rules of minor importance. Luchard, for example, mentions that apart from difficult research issues his emails are kept short, less than five sentences. Moreover, when composing emails he would not write in “upper case characters all the time and stuff like that” (Luchard 2008). This means that he follows the basic classic code of conduct when interacting or communicating via web. This classic code of conduct has been established for effective web based communication. Basically it consists of rules and orders people should follow when communicating via online tools, especially emails and chats, in order to guarantee fast and effective communication as well as reduction of misunderstandings. Since email correspondence has turned into the basic medium for communication, I assume that almost all scientists are aware of this classic code of conduct for manag-
2. Analysis of Interview Data

ing rapidly growing quantities of daily mails and have already partially adapted to it. In this respect Karadeniz (2010) refers to email as the main source for problems and misunderstandings due to ignorance or simply not following basic Netiquette rules. Rapidly reading emails mostly just skimming through very likely results in aggressive communication and lots of misunderstandings.

Thunder portrays himself as generally fairly forward, giving basic information asked for. Apart from being literate, using words, checking spelling he observes no usage of picky rules (Thunder 2008). There is no necessity for strict Netiquette rules when corresponding via emails as it presents a different style of interaction. It is quite informal. There is more correspondence but more like a chat. Peter Thaxter generally does not follow strict Netiquette rules in email communication. Apart from the usage of basic rules concerning formal communication he would adapt to the tone used by the person he responds to (Thaxter 2008). Finally, Dennis Morrison always tries to make a human response to everybody approaching him either online or offline. “It’s consistent behavior. It’s an ethical decision”, he states. Moreover, he refers to an emotional and individual Netiquette rule in his personal protocols signing his mails always with yours “aye” which means always yours for he left his roots behind. “It’s a kind of way because I left my roots behind. But there is still some type of contact. It’s a sense that just makes you slightly individual. I still try to get a human contact” (Morrison 2008).

2.1.5. Remarks on Language Use

To put it in a nutshell, we may say that all interview partners have already turned into email persons. Some more than others but all of them use email as basic medium for professional and personal communication. Email communication has revolutionized scientists’ working conditions globally. On the one hand fast and effective communication or collaborations even without face-to-face meetings are facilitated, but on the other hand rising quantity of incoming messages cause pressure for scientists. Some are still struggling for self-control to reduce time pressure caused by frequent instant personal dealing with incoming mails. Especially email junkies feel pleasurably distracted by email communication. For this reason they have to force
themselves to develop certain strategies for self-control mechanisms to be able to efficiently carry on with their scientific work.

Others apply certain techniques as well as strict self-discipline to avoid overload of mails, being flooded by mails or running danger of getting easily and pleasurably distracted. Those scientists who have successfully tried to resist using email correspondence are faced with a rising degree of group pressure and there seems to be no way left to totally escape email communication, neither on professional activities nor on private ones. Email communication has resulted in strong dependency on technical resources and permanent access. Moreover, a high degree of impatience and instantaneously expected responses has affected the way scientists manage and process their emails. In this respect we may draw the conclusion that scientists need to set priorities and develop certain techniques for efficient usage of mail communication to deal with increasing time pressure caused by increased quantity of incoming mails due to online tools provided by the Internet and the World Wide Web.

Email communication has resulted in low quality of proper language use. Experiencing time pressure and high quantity of email that needs to be instantly and personally managed, scientists lack time for thorough reflections and thus may cause misunderstandings. In this respect, another aspect concerning the usage of language has to be taken into account for my interview partners in Quebec. As French is the official language in Quebec, a lot of incoming mails would be in French. On the contrary English is the Lingua Franca of the World Wide Web and the Internet. In this respect scientists from Quebec use both languages for email communication and have shifted to using English when communicating internationally.

Since English is the Lingua Franca of the net scientists in Austria had to shift to using two languages dealing with electronic communication, especially email correspondence when collaborating internationally, too. Which problems are likely to arise when scientists are required to engage in asynchronous communication with partners from abroad? German native speaking scientists show different levels of command of the Lingua Franca to French speaking Canadians, whereas they are used to operate in a bilingual setting by now and have already shifted to using both languages naturally. Is it the same with Austrian scientists? Are they faced with more problems when communicating in English internationally? Are they more likely to
produce misunderstandings in email communication than others? Are German-speaking natives and English-speaking non-natives respectively marginalized compared to English-speaking native scientists? What does that mean for their scientific reputation? Has proper use of English already become a fighting tool in the field of science? Are English-speaking non-natives disadvantaged?

According to Seidlhofer it is obvious that when English is used as “contact language” (2005:339) (face-to-face or synchronous communication e.g. via Skype) between persons neither sharing a common native tongue nor culture there is no essential rise in misunderstandings or communication problems. In this respect Seidlhofer argues that “analyses of ELF (English as Lingua Franca) interactions captured in the [VOICE 2010] corpus clearly show that although ELF speakers often do not use the third person singular present tense ‘-s’ marking in their verbs, this does not lead to any misunderstandings or communication problems” (Seidlhofer 2005:340).

As far as the general meaning of a certain topic or discussion is concerned, Seidlhofer’s argument is right and is approved by most of my interview partners, too. Speaking in terms of biology, for example, “school of fishes” in German has got the meaning “Fischschwarm”. In this respect nobody confuses “school” of fishes with the educational meaning of “school” since the context itself shows the correct meaning. But dealing with smaller units of content and details inside the same context, misunderstandings may play a critical role since a formally correctly used word may refer to different issues in the same context. This could mean that communicators may not notice occurring misunderstandings and thus do not directly refer to them in form of inquiries.

I would like to illustrate this shift of meaning again with the word “school” but this time inside the same (educational) context. The German meaning of “school” is “Schule” which basically refers to primary and secondary education. In English speaking countries “school” not only refers to primary and secondary education but also to tertiary education. The word “school” refers to any type of formal teaching as provided in primary and secondary education within the public and private sector. But at the same time, it also refers to the university and its departments or faculty of university.
The same problem arises with the word “student”. The German translation of “student” is “Student”. The German meaning of student only refers to or is only connoted with a person studying at the university whereas in English speaking countries it refers to a variety of connotations such as “Tagesschüler”, “Schulkind”, “Forscher”, “Gelehrter”, “Hörer” and “Student”. These two examples (“school” and “student”) demonstrate a possible misunderstanding within the same context where communication partners probably are not aware of it.

Broszinsky-Schwabe illustrates this phenomenon referring to the example of a conversation between a German and an American using the word “friend”. The German meaning of the English word “friend” is “Freund” but still both actors do not mean the same. “Für einen Amerikaner ist ‘friends’ ein weiterer Begriff, der im Deutschen die beiden Begriffe ‘Freunde’ und ‘Bekannte’ zugleich einschließt. Den ‘Freund’ im engeren Sinn (der ja in Deutschland an bestimmte Eigenschaften gebunden ist) könnte man in Amerika mit ‘close friend’ übersetzen” (Broszinsky-Schwabe 2003:36). Additionally, she argues that translations from one language to another become even more difficult when dealing with abstract terms. The degree of abstraction varies among different languages so that paraphrases and transcriptions must be found to communicate the meaning of words appropriately.

According to the arguments I have discussed above, scientists may not be involved in misunderstandings requiring different contexts but they could be faced with this problem unknowingly within a specified context during the process of communication and collaborations. In this case my interviews cannot reveal these possible source of misunderstandings because my study participants are not aware of it. This problem could be especially critical for the Humanities since there the exact language connotation is an essential tool of knowledge analysis and production and often depends on linguistic subtleties.

In this respect, we have to take into account that the impacts caused by misunderstandings due to ELF interactions using online tools are more critical for the Humanities than for Natural Sciences. Since the Humanities focus much more on language as a tool for knowledge than Natural Sciences, misunderstandings are more likely to occur and even may increase due to online communication tools. The problem of misunderstandings due to the shift of meaning or loss of significance is not caused
by the Internet and the World Wide Web itself but it may be well the case that digital technology operates as a facilitator increasing misunderstandings concerning online collaborations and communication for the following reasons:

- High quantity of incoming mails reduces capability on thorough reflections
- Online communication is rather short, quick and instantaneous
- Lack of opportunities in electronically checking the appropriate meaning when engaged in online conversations

All these three specific aspects of the Internet strengthen the already existing everyday culture where inquiring into the exact meaning is not supported anyway.

According to the arguments I have discussed above, I suppose that scientists of the Humanities are required to develop certain strategies in avoiding misunderstandings caused by connotation issues due to ELF, for example, in order to effectively engage in online cooperations and online communication. They will need to develop a certain net specific code/net specific culture in order to avoid and limit possible misunderstandings. Finally, face-to-face interactions will continue to play an important role in most fields of the Humanities, which means that the Humanities will likely continue lagging behind in using digital technology for language reasons.

In the beginning of my research study in Section 1.1.2 I presumed that misunderstandings occur more frequently due to the fact that English has turned into the Lingua Franca of the Internet and the World Wide Web. This assumption turned out to be partially wrong since the results of my study show that most of the actors participating in my research study project have not yet incorporated the net specific code/net specific culture and thus show a strong tendency of caution when engaging in international collaborations as well as interactions using electronic communication tools. Most of them still write emails in a pretty formal way, for example, in form of letters, in order to communicate effectively and to avoid misunderstandings. I will deal with some more language issues again later on in Section 2.2.4.

Finally, another source of irritation on email correspondence relates to contamination by viruses. One scientist fights digital viruses by safe computing, telling friends
not to send him any of these idiotic funny messages because they are vehicles for transporting viruses. Moreover, he informs students that he would not read attachments from students’ emails because he does not want to be contaminated by viruses. Most students are not experienced users of their computers and this method for avoiding contamination proved to be highly effective. Generally scientists would install highly effective anti-virus software to protect their data from invading viruses. But this issue was not part of my research study and only mentioned by one interview partner. Thus I am not going into further details on usage of anti virus programs. Moreover, I assume that these programs have affected the habitus of scientists when communicating electronically since viruses are transmitted via emails. From my point of view they are aware of the dangers and demonstrate more caution with unclear and “foggy” subject lines and opening attachments.

2.2. Web Presence

2.2.1. General Description

Websites and weblogs form the second category I focused my research study on in order to find out about the transformation processes scientists are faced with due to online communication tools provided by the Internet and the World Wide Web. Before describing and analytically discussing the results of my study on this category I first want to refer to two basic distinctions I considered important when collecting data and analyzing it as far as websites are concerned:

1. What are the main differences between official and personal websites? A professor’s official website is part of the general university website or the department’s website and usually created and updated regularly but not frequently by people of the university’s technology center or assistants. It provides basic information and data on a scientist’s professional activities, interests of research, his/her CV, data for students and colleagues. In contrast personal websites are created and maintained by the professors themselves and thus provide a great potential of creativity to meet individual needs of what a sci-
entist considers important information about his/her research work and other professional or collaborative activities.

2. What are the main differences between a website and a weblog? Generally, weblogs are defined as frequently updated websites where the entries—called posts—have a timestamp and are presented in a reverse chronological order with the most recent post at the top of the page. At their core Bausch, Haughey and Hourihan define weblogs as follows: “Weblogs are pages of several posts or distinct chunks of information per page, usually arranged in reverse chronology from the most recent post at the top of the page to the oldest post at the bottom” (Bausch, Haughey, and Hourihan 2002:7). According to the definition of weblogs by Bausch, Haughey and Hourihan weblogs are usually updated more often than websites for “the smaller changes and lower amount of effort required to add a new weblog post as opposed to adding an entire webpage full of content to a typical site” ((Bausch, Haughey, and Hourihan 2002:8)). A website is updated maybe only once a year, a weblog more frequently such as daily or several times weekly, monthly depending on the weblog author and his/her frequency of entries respectively posts.

Weblogs may be created and maintained by a single person, a small group or even by large communities (cf. Schmidt 2006). Type of content provided by blogs varies greatly since it focuses on the thoughts and experiences of the author. “A blog usually takes on the character of the person or persons that contribute to it because it is so simple to update. This ease of use leads to frequent posting, which creates a fluid, ongoing, ‘conversation’ with an audience that helps to bring out the nature of the person ‘behind the screen’” (Stone 2002:9). In this respect I conclude that weblogs provide the opportunity of formal and informal communication and thus may be used as a powerful tool for presenting professional profiles as well as networking among scientists. But the number of scientists regarding weblogs of minor importance due to low quality content such as entries on private issue or as simple comments on other people’s comments is still high. Therefore, most of them do not consider keeping a weblog as relevant for their scientific work and thus rather use official and personal websites for their web presence.
The qualitative analysis of my research study shows that all scientists have an official website as part of the university or department website providing basic information on their work and curriculum vitae. In this respect they are part of their universities’ general web presentation policies. Some scientists have created and maintain personal websites in addition to the official one or as a substitute. As far as weblogs are concerned most interview partners referred to this type of web presentation as of minor importance and thus almost all of them do not keep weblogs and do not intend to start one in the future. There are some who consider maintaining their personal blog once they are retired or at some later stage in their professional lives. Only one interview partner keeps it all: personal website and a personal blog and even maintains them in two languages, English and French. In this respect I assume that the number of scientists using weblogs for their web presence is very likely to rise in the near future, since weblogs will gradually complement or maybe even substitute personal websites and present a need-to-have tool on existing official websites.

Concerning website and weblog I focused on the following categories and subcategories respectively: Personal website, personal weblog, official website, considering personal website or weblog, time consuming, weblog substitute, publication of private matters, publication of research work, discussions, promotion of research work, frequency of posting comments, pressure to go online, entertainment, visiting blogs or sites for data research, blog supports network dynamics, reading blog relaxation and brain exercise.

2.2.2. Websites and Weblogs

Websites have already become a need-to-have tool for scientists for various reasons. All universities worldwide have official websites to present their general research profile, departments’ profiles as well as staff profiles and general administration issues. Online registration for students’ courses, for example, is considered standard. Study information and study material for students are provided as downloads on a university’s site. For this reason, universities aim to provide basic information on faculties, departments, curricula and courses offered. Additionally, general issues of research interests, ongoing research projects on national and international level
as well as current or future research projects are publicly accessible. Generally, university technology centers provide standardized maintenance so that updates may be delegated to staff responsible for information technology and the new media. Moreover, they provide continuous staff training on using electronic tools so that researchers themselves are able to personally keep and maintain a website or weblog.

Most of my study interview partners use official websites for publishing and promoting research work but do not intend to start and keep a personal website or personal blog due to various reasons. First of all, they do not regard it a necessity to engage in more web presence by individually creating sites or blogs. Second, lack of time is regarded a highly critical factor because scientists need to invest time acquiring technology to be able to personally create and update a personal website, for example. Finally, lack of motivation is referred to as further impact factor concerning personal disengagement. Simon Lenz refers to lack of intrinsic motivation, lack of technical knowledge as well as no need for further web presence as some of the main reasons for not maintaining a personal website or personal blog. “Es ist mir zu mühsam. Erstens kann ich es technisch nicht und ich habe keine Lust mich jetzt da lange einzuarbeiten. Ich versuche gewissermaßen nur inkremental zu lernen in dem Sinne, jetzt brauche ich etwas. Jetzt muss ich z.B. mit unserer Campus-Software umgehen und das habe ich mir schon seit einiger Zeit angeneignet. Ich weiß wie das funktioniert” (Lenz 2007).

Moreover, he describes himself a slow learner due to lack of ambition and lack of technical knowledge. “Ich weiß zum Teil schon gar nicht mehr was sich hinter diesen Ausdrücken verbirgt,” he argues. In this respect there is no need for him to start a personal website or blog and he considers delegation of keeping or maintaining a website or blog to his assistants a critical factor because it would result in extra work for them. “Am Institut haben verschiedene Leute ihre Homepages. Weil ich selber nicht gut damit umgehen kann, müsste ich zunächst einmal die anderen meine Arbeit machen lassen. Und die anderen sind gut genug beschäftigt” (Lenz 2007).

Here we can see very clearly that keeping and maintaining personal websites and blogs is very time consuming not only for slowly progressing “digital immigrants” but also for “digital natives” though to different extents (see Section 3.1). Due to lack
of technical knowledge “digital immigrants” need professional experts for maintenance. Additionally, external impulses, incentives and group pressure are required to start a blog or website. “Erstens bräuchte es ein paar Leute, die mir sagen, Du, jetzt wird es Zeit und zweitens könntest Du hier Deine Publikationen reinstellen. Da musst Du nicht auf Anfragen antworten, denn die Leute können sich das runterladen. Wahrscheinlich bräuchte ich jemanden, der mich so ein Stück an der Hand nimmt, mir das beibringt, wie das funktioniert und wie ich das pflegen kann” (Lenz 2007).

Constant time pressure presents a highly critical factor for not starting a personal website or personal weblog. Some scientists would like to create their website for publishing, promoting research work and providing basic information on her professional activities and data for students as well colleagues. At the same time, availability of maintaining a personal website is desired to be able to integrate more creative elements for she considers the official website providing a schematic representation of the main data as boring and not really interesting. Müller-Mandl herself would like to create her personal website but due to lack of time to invest in learning how to properly operate electronic tools for creating and maintaining a website she is not able to do it personally (Müller-Mandl 2008).

Others like Farmer have already started to integrate international networks in their official website. At the moment of giving the interview he was setting up an international network of labs on the website that is going to become a resource especially for developing countries. The main reason for creating that network is that scientists from developing countries lack high speed Internet or public access to search for material and publish their work online. Therefore, the main goal of that website is to create a resource web where people can provide and gather information on different animal diseases, their origins, what is happening with a disease, and the reasons why or how it occurs in different countries. Concerning a personal weblog there is no need, no reason for him to keep a personal website. “Weblogging I guess I have never got into it. There is no reason. It’s enough for me. I’ve never felt a need for weblogging” (Farmer 2008).

Apart from his official website, Lacroix keeps a personal website in French, English and German. The reason for using German is that most of his current research is
in Germany. For this reason he decided to include parts in German to make it accessible for German speakers. Both websites are used for publishing and promoting research work as well as providing teaching material and information on teaching courses. He considered starting a weblog but finally rejected it for the following reasons. First, from his limited participation in other blogs he considers blog communication rather superficial for it tends not to be very pointed. Second, it provides people with the opportunity to confuse opinion with research. Finally, they are of no use to him as they lack opportunities to critically reflect and engage in scientific discourse (Lacroix 2008).

Irving Winter keeps a personal website he updates once a year. He often considered starting a weblog but due to lack of time as well as issues of maintenance he has not become a blogger yet. In this respect Winter refers to the main difference between weblog and website. A weblog requires maintenance whereas a website is catalogue standard. Winter’s personal website is both a need-to-have and a nice-to-have tool as he uses it for publishing and promoting his research work. He puts all his publication on his website even if it is published somewhere else and he is purely promoting his own research work on what he and his students are doing. He even keeps a sort of weblog substitute as I would call it in form of yearly lengthy Christmas letters on private matters such as family life published on his website. Although this information is exclusively written for friends, his professional colleagues find it interesting as well for they can read what Winter and family are doing. In addition, keeping a scientific weblog fails due to lack of time and remains a future project (Winter 2008).

Apart from his official university website, Peter Thaxter keeps his personal website for the following reasons. First, it deals with practical copyright matters and second, with standard and course readymade material in his field of study. According to Thaxter, a personal website presents an excellent tool for publishing as no permission is required to make ones work known. Generally, it was very difficult for musicologists to publish their work, for they could not publish without permission, he argues. Now they may use websites for publishing and promoting their work without anybody objecting. “That was one reason that prompted me to go that way. So it would be possible for myself and other media music researchers to kind of make our works known” (Thaxter 2008). As far as teaching is concerned his website facilitates to provide all information, material, and administrative issues on his courses.
2. Analysis of Interview Data

“I can put all the instructions about how to do which assignments onto the Internet and I don’t have to stand in front of the photocopier for ages and ages. I can just change the text every once in a while and add things. It’s so much more convenient” (Thaxter 2008). Additionally, books in his area tend to focus on formal communication. Now with the usage of electronic tools provided by the World Wide Web and the Internet it is technically possible to integrate and discuss informal parts as well.

The reason for maintaining his personal website in English and French is closely related to the requirement by French speaking universities in Quebec to teach in French and therefore provide course material in French.

Concerning weblogs he rejected the idea of keeping a blog for it would result in rising quantity of mails. He also demonstrates rare frequency of posting comments. In contrast he would visit both blogs and websites very often. Visiting websites and blogs for professional reasons such as the [Internet Movie Database], or [Music.Com], sites on music or film bibliography. Moreover, there are good individual sites from friends and colleagues he frequently visits, or usage of [YouTube] and [Amazon] (Thaxter 2008).

Like most interview partners, Maier uses his personal website for publishing and promoting his research work. In this respect he points out that part of his website show similarities to a weblog. “Meine Website ist zum Teil das was auch Weblogs sind, nämlich ein gewisser Exhibitionismus. Abgesehen davon, dass man dort seine Publikationsliste und seine Vortragsliste hat, was manchmal ganz nützlich ist für einen selber oder auch für andere, gibt es dort auch noch Bilder, die mich in aller Welt in irgendeiner Situation zeigen. Diesen Teil meiner Website pflege ich nicht sehr, aber alle zwei Jahre gebe ich dann wieder fünfzig Bilder dazu und das ist natürlich reiner Exhibitionismus. Das ist ja etwas was den Bloggern und Bloggerinnen vorgeworfen wird” (Maier 2007).

There is no reason for him to keep a personal weblog because he is not interested in making his private diaries accessible to the public. “Es ist für mich ein wesentlicher Unterschied, ob ich den Computer verwende, um gewisse Informationen mitzuführen. Das tue ich sehr wohl. Ich sehe aber keinen Grund über das hinauszugehen was ich auf meiner Website ohnehin schon tue, nämlich gewisse Sachen auch öffentlich darzustellen” (Maier 2007). Moreover, he considers blogs only presenting
private matters as pure exhibition but with no relevance for scientific work. Further features of blogs Maier critically reflects on are one-dimensional discussions resulting in low quality of content. "Ich muss gestehen, ich halte das Bloggen an und für sich schon für eine gemischte Geschichte. Wir haben seit es Internet gibt so etwas wie Diskussionsforen. Für mich sind Blogs eigentlich abgemagerte Versionen von Diskussionsforen, weil nur eine Person redet" (Maier 2007).

Apart from the official website at his university, Thunder does not keep a personal website or personal weblog. Like Winter he uses the official website for publishing and promoting research work. In his school/department they maintain a website providing open access to all research projects including documentation of the projects, materials, surveys and evaluation. "We have set up a virtual research environment for our work other people seriously could join" (Thunder 2008). There is no need for Thunder to keep a personal website or personal science blog as the official website provides sufficient web presence for both teaching and research. He has never considered keeping a personal blog for the following reasons: First, setting up and maintaining a blog is rather “intrusive” for him and it would even increase the quantity of emails. Second, he is not lacking discussions with international scientists. Third, there exist some reservations about being too accessible. Fourth, even working with bloggers has had no influence so far on him. Generally he would visit blogs, when searching material for research.

Liebminger uses his personal website not only for publishing and promoting his research work but also for providing basic information for students and colleagues, on his professional activities and research areas. He personally maintains his clearly structured website, regularly updates central information such as examination dates for students, dates of his talks or public appearances. As far as his publications are concerned he prefers to publish a rather limited number of his texts at his website because he does not consider the “virtual world” as an ideal location for his publications. In this respect he claims that “nur solche Texte von mir drinnen sind, die schon woanders publiziert sind. Texte, die ich sozusagen als Dokumentation, Anregung, Hinweis, Appetithappen rein gebe. Die auch mit den Verlagen, wo die Texte ursprünglich erschienen sind, abgesprochen sind. Ich bin da ein bisschen altertümlich. Ich glaube, dass die virtuelle Welt für mich nicht der ideale Publikationsort ist, sondern ich sehe mich gerne gedruckt, sinnlich angreifbar und nicht nur virtuell
2. Analysis of Interview Data

He is not interested in keeping a personal blog for the following reasons: First, there is no need to intensify his web presence since he considers both his non-digital “mediale Präsenz” and his internet existence referring to “143 000 Einträge unter seinem Namen” as a scientist as sufficient. “Man führt ohnehin so eine gespenstische Schattenexistenz im Internet. Das will ich jetzt von mir aus nicht noch einmal intensivieren wollen. Das passiert eh von selber”, comments Liebminger. Second, blogs as tools for presenting private matters, commenting on daily trivia in form of frequent diary entries in public do not present communication channels for him or his areas of interest. “Weblogs sind nicht meine Äußerungsformen. Ich führe auch kein Tagebuch. Ich kommentiere nicht jeden Tag was irgendwo passiert. Mich interessieren solche subjektiven Äußerungen von Zeitgenossen und Zeitgenossinnen eigentlich überhaupt nicht“. Third, low quality and no relevance for his scientific work. “Es ist mir in gewisser Weise zu flüchtig. Wenn ich schreibe, dann denke ich länger darüber nach. Wenn ich formuliere, dann möchte ich meinen eigenen Ansprüchen gerecht werden und stilvoll formulieren. Es war nie mein Ziel schnell etwas für den täglichen Bedarf zu produzieren” (Liebminger 2008).

According to the arguments described above it is obvious that most scientists critically view weblogs as an appropriate tool for publishing and promoting scientific work. Low quality of content provided by blogs is still referred to as the main critical cause. Blog entries are not considered relevant factors for scientific work because most blogs offer “the opportunity to confuse opinion with research” and “lack opportunity to critically reflect”. Additionally, there is no interest in making private diaries publicly accessible. Blogs would also contribute to rising quantity of emails for scientists and some of them “have reservations” about “being too accessible”. All in all, there are too many disadvantages and almost no incentives or benefits that may be derived from keeping a blog for scientific purposes. Thus there is no need, no relevance for integrating this tool in a scientist’s professional activities. Most do not consider keeping blogs as nice-to-have-tools concerning research, engaging in scientific discourse as well as international collaborations.
In contrast one interview partner considers a blog an excellent tool for scientific communication and scientific discourse. He also refers to a blog as a substitute for a personal website. At the time of our interview he was actually thinking about substituting his website by his blog. Daniel Luchard is the only interview partner who keeps an official website, a personal website and a personal weblog. Moreover, he maintains his website and weblog in both languages, English and French. Reflecting on the reasons for having an official website as well as a personal website and a blog he argues as follows: first, his official university website only presents limited personal profile. So he would add his CV to provide more information about him. Second, the reason for having both blog and website is based on history as the website historically originated before the blog. Luchard started his website many years ago to provide information on his professional life, publishing and promoting research. Concerning publishing papers, for example, he links to his papers from his homepage. But increasingly he relies more on official archives and other tools to distribute and link his papers. For this reason he could easily get rid of his homepage as “the main purpose right now is to give my name, my address, and my CV” (Luchard 2008).

Third, he regards keeping a personal weblog a highly important factor for scientists as it presents a tool for providing both formal and informal communication. From his point of view informal text is very important and necessary as one cannot only communicate formally in the field of science. When you are interested in a researcher’s work, for example, you want to get some information about him as well and this extra information is not provided in papers or homepages that are fairly static. In this respect Luchard considers a blog a very powerful and innovative tool as far as informal communication and networking among scientists is concerned. A blog shows which people you are collaborating with as well as the research issues you are interested in, whereas an official website provides a limited professional profile.

Luchard agrees with Stephen Downes, a computer scientist and friend, who refers to the fact that scientists are moving from groups to networks. A group is structured and determinate, you are in or out, whereas a network has no fixed center and no fixed leadership and therefore people may connect easily. Scientists are moving in that direction and blogs facilitate that move for providing new communication channels. In the field of science there exists a visible shift from
rigid to dynamic communities respectively networks. Formerly scientists belonged to rigid communities; one could easily identify to which community a researcher belonged. These days in Luchard’s point of view, scientists are becoming more and more “misfits” as they do not belong to one rigid community anymore. “It is more or like that they are moving away from that” shifting from fairly static communities to dynamic ones (Luchard 2008).

As for the issue of language Luchard uses both languages for obvious reasons. He keeps both his personal website and personal blog in English and French. But his blog in French is mostly aimed at students for he does not expect an international relationship from it. Therefore his blog in French is exclusively written for his students (Luchard 2008).

Some scientists regard keeping a personal weblog as a nice-to-have tool and refer to the advantages for professional activities in research. But due to time reasons they have not implemented one yet. Duchamp, for example, personally would be more interested in a blog than a website for the following reasons: A blog presents the easiest and more dynamic way of expressing ideas. Additionally, he regards a blog as a tool for presenting pre-publications to a wider audience for trying out new ideas. “You always have a few ideas you are not sure if they are that good yet and a blog would be a very good way for trying them out” (Duchamp 2008). Similarly Annette Pongratz considers personal websites and personal weblogs important for scientists and would like to maintain a blog or website herself to present her scientific profile and publish, promote research work, publish pre-publications for scientific discourse, enable networks and provide a pool of projects. “Eine Website oder ein Blog, das ich selbständig führe, fände ich interessant. Als Möglichkeit des Austausches mit anderen, als Präsentation des wissenschaftlichen Expertisenfeldes und vielleicht auch so eine Projektpartnerbörse” (Pongratz 2007).

2.2.3. Visiting Websites and Weblogs, Posting Comments

Most scientists frequently visit websites and subject related websites respectively in order to search for research data and inform themselves on the latest developments on certain scientific issues relevant for research work, teaching and projects. Farmer,
for example, demonstrates high frequency of visiting subject related websites and blogs in search of scientific data, articles and information in his field. Thanks to electronic tools provided by the Internet and the World Wide Web he can search for data from his home or office now whereas in the old days he physically had to go to the library. This was very time consuming. Now he would search PubMed to get the maximum of relevant articles. Additionally, he would search other websites because on the scientific side it tends to be more articles he is searching for. On the applied side he would visit government websites, company websites, or other researchers’ websites to gather information and data. Basically he spends a couple of hours on searching for the information needed. “I spend a couple of hours just going from one website to the other. You start with one thing and then you just go from there on to another, you just follow a line all the way. Two hours later you have got all the information you need” (Farmer 2008). Concerning online data research he demonstrates frequent usage of all tools with Google, Google Scholar, PubMed or CABI, a non-profit science-based development and information organization with a data bank of publications for getting scientific papers.

In contrast some demonstrate rare frequency on visiting other websites or blogs. Matthew Denver would visit them in search of specific information. “Not much I have to admit. If I want some specific information, I look for it on different websites. But it’s only when I want some specific information, that I would do it this way” (Denver 2008). Others like Alberta Jackson engage in regular blog reading such as reading an American friend’s blog about articles on the political situation in the USA or a website on the best international journalists’ articles in daily newspapers present another form of using the Internet. Using the World Wide Web for reading good journalism once or twice a week stimulates the brain and supports her in thinking in a more agile way (Jackson 2008). She refers to reading the website on international journalists’ articles as a “great form of relaxation” because the writing of good journalists helps her to “write better as an academic”. Relaxation and brain exercises on improving writing skills are further factors for using the World Wide Web.

Generally Lacroix does not visit other blogs for just a few people are interested in the kind of research subjects he likes and blogs in Anthropology he very often considers pretentious. According to Lacroix’s experiences, serious blogs are very “rarely set up” because people mainly would create blogs out of frustration, provocation or creation.
of a public personae. In this respect he does not consider blogs an appropriate tool for scientific discussion. Bloggers mainly seem to create their public personae and so it is a very one-dimensional identity that is blogging and therefore it is a waste of time visiting these blogs or posting comments (Lacroix 2008).

As far as postings of comments is concerned most scientists show a strong tendency not to or rarely engage in posting comments for the following reasons. Lack of time, low quality of posting comments as well as difficulties managing user names and passwords. Lenz demonstrates rare frequency of reading comments but does not engage in posting comments. In this respect he refers to personal difficulties and complications in managing and dealing with user names and passwords. “Wahrscheinlich hat das auch wieder mit meiner technischen Distanz zu tun. Wenn ich mir vorstelle, bei Kreditkarten habe ich so und so viele Pincodes, dann wollen die alle einen Username und ein Password. Ich habe das einmal probiert und einen einfachen Username gewählt, den ich mir merken konnte. Da hiess es wir haben schon einen. Das ist mir dann einfach zu umständlich, dann brauche ich bald eine eigene Buchhaltung für die verschiedenen Usernames und Passwörter” (Lenz 2007). Here we may conclude that complicated management of usernames and passwords are impact factors for reading and posting comments, especially for digital immigrants (cf. Section 3.1).

Other interview candidates definitely do not want to post or read comments because they consider such comments as low quality products. Müller-Mandl does not engage in posting comments because she considers postings of low quality, superficial, of no value for scientific discourse. Additionally, she refers to lack of time as well as lack of reasons for commenting other people’s ideas. “Warum soll ich kommentieren?” she critically asks (Müller-Mandl 2008).

Accordingly, Liebminger demonstrates rare frequency reading comments but no posting of both traditional and online comments. He refers to the following reasons for not engaging in posting comments at all. First of all the net does not provide him with appropriate facilities for critically commenting on certain issues “Ich möchte das in einer Form tun mit der ich zufrieden sein kann. Das Netz bietet für mich keine attraktive Möglichkeit dies zu tun. Soweit ich das abschätzen kann, werde ich das auch in nächster Zeit nicht nützen” (Liebminger 2008). Moreover, he has
never written letters to the editor and will never post a comment on any issue in the Internet. Finally, he is not willing to expose himself to the pressure of producing daily or weekly comments on a regular basis. Whenever he wants to critically reflect and comment on certain issues, he uses other means of communication such as writing an article or an essay. “Wenn ich etwas so interessant finde, dass ich dazu etwas sagen will, dann suche ich mir schon eine entsprechende, angemessene Öffentlichkeit. Dann schreibe ich einen Essay, einen Artikel, einen Kommentar in einer Tageszeitung. Ich werde aber sicher nichts posten” (Liebminger 2008).

Once in a while he would read postings and comments. “Hin und wieder lese ich sozusagen meine Mail im Internet, weil es schneller geht, ich mir nicht immer alle Zeitungen kaufen muss. Ich lese dann die Postings, die es dazu gibt. Ich bin mittlerweile zutiefst der Überzeugung, dass es sich nicht auszahlt Postings zu lesen” (Liebminger 2008). In this respect he points out two main reasons. Low quality and small posting communities using their own rituals and Netiquette rules. “Bei den Leuten, die posten, dürfte es sich um sehr, sehr kleine Communities halten, die sich da gegenseitig in Postingrituale verstrickt haben. Und das Niveau dieser Postings ist wirklich unter jeder Kritik. Es ist vollkommen uninteressant” (Liebminger 2008).

Winter updates his website once a year and does not use it for international discussions at all. “I don’t use my website for discussions. I just do a lot by email” (Winter 2008). This results in rare frequency of posting comments on websites or weblogs, too. Posting comments on websites seems to be rather unusual for researchers in general. Scientific discourse and critically reflecting are done via other media, e.g. emails, conferences etc. Winter himself discusses two reasons for quite rarely posting comments: one reason is lack of time, another one that critical reflection in science needs time due to the desire to express oneself explicitly (Winter 2008).

Thunder’s frequency of posting comments is rare. Posting comments would be another time constraint, impede his personal method of rationalizing time. “I mean I have a fairly hectic agenda as it is. I don’t want to get any more stuff in.” Moreover, he refers to his personal experiences of setting up groups facilitated by electronic tools that the results are poor for the amount of time spent in the entire group forming process. “I am quite interested in all kind of concepts such as Web 2.0 and sort of people making up these nice interesting groups and so on. My experience in trying
to set up groups is mixed. When we structure them, you probably spend all time getting it up, posting stuff and you get very little back” (Thunder 2008). Apart from posting comments in learning management tools as feedback for her students Pongratz does not generally engage in posting comments due to time reasons. “Es ist ein Zeitproblem. Die Mails führen schon dazu, dass man sich kommunikativ verausgabt. Wenn ich etwas poste dann sollte ich es schon wie bei meinen Studierenden in der Lernplattform tun. Für diese Art von Feedback bleibt aber im Moment zu wenig Zeit übrig” (Pongratz 2007).

Referring to posting comments in websites and blogs Denver argues that he posts comments pretty rarely only if he feels he has something to say on a person's question. “Not a huge number I guess. The way it normally operates. People put a question up for answering. If I feel I have got something to say, then I would do it. But pretty rarely I must admit” (Denver 2008). Thaxter also demonstrates rare frequency of posting comments. In contrast he would visit both blogs and websites very often. Visiting websites and blogs for professional reasons such as the [Internet Movie Database], or [Music.Com], sites on music or film bibliography. Moreover, there are good individual sites from friends and colleagues he frequently visits, or usage of [YouTube] and [Amazon] (Thaxter 2008).

Following my interview partners’ arguments on reading and posting comments we may draw the conclusion that comments placed in the various communication tools provided by the Internet and the World Wide Web are rather inappropriate tools for engaging in scientific discourse and critically reflecting on research issues. Carefully weighing the pros and cons of such technical devices, scientists consider them rather low quality remarks not attempting to initiate or provide the basis for scientific discussions. Critical thinking, critical reflection needs time and space. Scientists as digital immigrants have been socialized in real worlds and not in virtual ones.

2.2.4. Remarks on Language Use and Concluding Thoughts

Summing up, we may conclude that although blogs facilitate networking, building research communities and are highly effective communication tools for scientists to share ideas, material and collaborate globally, most of them have not experienced
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these potentials for effectively integrating into scientific work. They still use official websites for promoting and publishing research work as well as providing basic data on professional activities and teaching material. On the contrary I assume that websites in the future are very likely to play a minor role in science for their static features such as presenting limited professional profiles and not including tools to communicate informally. Keeping a personal weblog is already regarded a nice-to-have tool for various scientific purposes. Most scientists would like to start a blog but due to time constraints they prefer to wait until they are retired, for example.

What are the reasons apart from those that have already been discussed and described in the chapter above that none of my Austrian interview partners keep or maintain a personal blog for scientific purposes? Mostly, Austrian scientists, for example, have been engaging in scientific work and research in German so far but due to implementation of electronic tools by the Internet and the World Wide Web quantity of international contacts, collaborations and the importance of using the Lingua Franca of the net have risen rapidly. German-speaking scientists not only feel the pressure caused by online technology but also experience lack of command of English in order to effectively engage in web presence or scientific discourse. Most of them show a very good command of English for spending their sabbaticals in English-speaking countries. But since they were not born bilingual I assume that they are more disadvantaged in acting globally within their field of science. As far as community building and networks are concerned they are required to adapt to the rules imposed by language use such as the Lingua Franca of the net.

In this respect I conclude that Austrian scientists seeking an international reputation are forced to acquire a highly advanced level of both language used on the Internet and English used in a face-to-face setting. Increasing web presence and communicating via electronic tools causes more problems as well as cases of misunderstandings for English-speaking non-natives than for English-speaking natives. For this reason, the number of scientists lagging behind in using and adapting to online technology is probably higher than in English-speaking countries. Additionally, I consider this a further impact factor on totally resisting electronic tools. It is not only caused by the tools themselves but also due to low command of the Lingua Franca of the net. Scientists as non-natives of English are still struggling with transitional stages of second language acquisition.
As far as keeping a personal website or personal weblog is concerned, they need to create and maintain these in two languages, English and German, whereas English natives may only engage in web presence in their mother tongue. Others are required to shift from traditional tools to virtual ones on two important issues in science: language and technology. Thus they demonstrate a higher degree of reluctance in using weblogs, for example, as these require regular and frequent entries on certain scientific issues. In contrast maintaining and updating official websites may be easily delegated to assistants or other people at university. But a blog is kept individually and thus requires both knowledge on operating technology and proper language use.

Critical thinking and reflection in scientific discourse needs time and space and thus create more problems for English non-native scientists to engage in rapid electronic communications, highly effective web presence such as creating sites or blogs as they need to shift to using two languages naturally first. For this reason most scientists need to make the decision which language they are using to create their websites or blogs in. English, German or in both languages since international reputation requires English but on the national level it is German. How to solve this problem? Most scientists decide on both languages while others prefer a German web presence. Some would employ translators to be able to use both languages.

2.3. Videoconference, Chat and Discussion Forum

2.3.1. General Description

Participation in videoconferences, chats and different types of discussion forum presents one more category I integrated into the analysis of my study research to gather data on the transformation processes experienced by scientists as well as describing these. Generally most scientists would participate in videoconferences as part of their professional activities to various degrees. Most interviewed scientists demonstrate average to rare degree of conducting videoconferences whereas only a few re-
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Concerning videoconferences, chats and different types of discussion forum I focused on the following categories and subcategories respectively: professional or private participation in videoconferences, importance of technology resources, professional or private participation in chats, professional or private participation in discussion forum.

Which are the main reasons for scientists refusing participation in videoconferences, chats or different types of discussion forum? According to my interview partners the following reasons are taken into account. Face-to-face communication is considered a basic requirement for professional activities. Moreover, scientists do not want to talk to anonymous people or pseudonyms. Socialization in the real world and not in the virtual one is referred to as a further impact factor. In this respect scientists as digital immigrants are not only faced with difficulties operating these electronic tools but also the speed and, closely related time, pressure in how communication takes place in chats, for example. Finally, administrative obstacles due to university policies are impeding engagement with communication tools such as videoconferences, for example.

Liebminger, demonstrating no professional participation in videoconferences, chats and different types of discussion forum, refers to face-to-face meetings as essential and basic requirement in professional communication. “Ich glaube, dass die sinnliche Präsenz, die Realität für bestimmte Kommunikationsformen unerlässlich ist. So einer Internetkonferenz oder einer Videokonferenz verweigere ich mich. Wenn ich mit Menschen diskutiere, will ich mit Ihnen von Angesicht zu Angesicht diskutieren. Ich will im virtuellen Raum eigentlich nicht diskutieren. Wenn ich sozusagen etwas veröffentlichen will, kann das durchaus eine visuelle oder auditive Dimension haben. Etwa eine Fernsehdiskussion oder ein Radiobeitrag. Das mache ich und dann sollen die anderen darüber diskutieren” (Liebminger 2008).
Moreover, he lacks motivation for engaging in virtual chats because he does not know exactly what kind of identity actors joining a chat have. “Mich interessiert das nicht so. Ich kenne diese Personen nicht. Das sind Anonyme oder auch Pseudonyme. Man weiss nicht wer sich dahinter verbirgt, wenn es sich um einen wirklich virtuellen Chat handelt wo jeder sich einklinken kann. Nein, das hat mich eigentlich nie wirklich interessiert. Nicht einmal im Versuchsstadium.” Finally, his socialization as digital immigrant causes difficulties such as nervousness when taking part in rapidly moving virtual interactions. “Ich war in meinem ganzen Leben noch in keinem Chat Room. Dazu muss man sagen, dass ich anders sozialisiert bin. Ich schaffe es nicht, dieses letztlich schriftliche Medium als Redemedium zu verwenden. Ich mag das hin- und herschreiben nicht. Schon E-Mails, die so schnell hin- und hergehen, machen mich nervös” (Liebminger 2008).

Müller-Mandl draws a parallel to Liebminger when describing the reasons taken into account for not dealing with professional participation in videoconferences, chats and different types of discussion forum at all. First of all she reports on lack of motivation to get involved in professional discussions with anonymous people. Second, lack of time to be able to effectively use such tools for scientific discourse. Third, administrative reasons at university cause limitations to professional participation as a scientist. “Videokonferenzen müssen bei uns angemeldet und geplant werden. Das ist dann ein großer Organisationsaufwand. Sie müssen sich ins EDV-Zentrum begeben. Sie müssen bitten, dass das jemand installiert, dass jemand Zeit hat” (Müller-Mandl 2008). Generally she considers videoconferences as an appropriate and quick tool for engaging in scientific discourse with other scientists on certain research issues. But due to administrative barriers as well as lack of technical knowledge it is hardly used.

On the one hand, as a digital immigrant she critically questions whether the final result is really worth the input such as time, effort and organizational issues. But on the other hand she would like to integrate videoconferences, audio or text chats in her collaborations with K. as far as teaching is concerned. “Die Frage ist wirklich ob ich es brauche oder ob es soviel bringt wie es Aufwand ist. Ich würde es aber schon gerne im Bereich der Lehre mit einem Partner in K. machen. Eben unter der Voraussetzung, dass ich den gesamten Ablauf delegieren könnte” (Müller-Mandl 2008). In this respect, we may conclude that digital immigrants need a high degree of technical
support, various opportunities for total or partial delegation and training. The main reason for not engaging in these tools is not fear but lack of time to become more literate concerning electronic communication tools provided by the World Wide Web and the Internet.

In addition Irving Winter questions if videoconferences or “videophone can substitute those face-to-face meetings. I personally doubt it. But I don’t have any experience with that. I doubt it and I suppose that’s really why I haven’t bothered to get involved in a videophone interaction” (Winter 2008). He might engage in occasional family chats when abroad. Morrison deals with professional participation in videoconferences rarely only when consulting international clients. Moreover, he prefers to go and have face-to-face communication (Morrison 2008). Here we may conclude that videoconferences may not substitute face-to-face meetings and in Morrison’s case technology resources at the department are of average importance.

Lacroix does not professionally participate in videoconferences, chats, or types of discussion forum. “Participation in videoconferences has never occurred to him and never will”, he argues. He describes himself as an old fashioned guy. Moreover, throughout his entire life he has considered conferences somewhat superficial and cannot see the advantages of a media conference (Lacroix 2008). Here we can draw a parallel to Luchard as he refers to conferences only providing formal communication, presenting something, whereas outside the conference people give their private opinions. Others like Lenz demonstrate no professional participation in videoconferences, chats and different types of discussion forum at all because so far there has been no reason to engage in professional participation using these communication tools (Lenz 2007).

Some scientists do not conduct videoconferences or chats for professional activities but would occasionally use [Skype] for long distance calls on student matters or private talks. Peter Thaxter mentions that he uses Skype much more for private communication with family members, friends and colleagues. Usage of Skype for making phone calls with students would only take place in case of a long distance call. But he would not engage in videoconferences or chats professionally (Thaxter 2008).
Integrating electronic communication tools such as videoconferences, for example, for hiring faculty staff, teaching courses and collaborations with students, international collaborations or projects, staff meetings to discuss certain issues are reported on as the main reasons for rare, average and high degree of participation.

Basically, John Sellers demonstrates rare professional participation in videoconferences. In the process of hiring faculty staff recently he was involved in teleconferencing and experienced that virtual job interviews do not negatively impact quality of interviews and decision-making process. “In this particular case of hiring a faculty lecturer our entire research committee and I experienced this for the first time in my life at the university that we unanimously chose our number one on the basis of the phone interview” (Sellers 2008). Moreover, candidate number two was chosen with the majority of the colleagues. He does not engage in professional or private chats because he needs time for reflections. Here we may draw the conclusion that professional engagement in chats impedes properly reflecting on content due to time limits.

Occasionally Jackson is involved in videoconferences on job interviews being part of an interview team. “Probably twice a year I would be involved in an interview situation. So maybe someone is applying for a job, then I might be part of an interview team.” Moreover, sometimes as there exists a connection with a remote campus there are online meetings with staff on that campus. Jackson refers to these meetings as “regular staff meetings”. She rarely conducts chats. Mostly with her only Skype-friend, a professor, she would chat over Skype occasionally but rather on personal things than work (Jackson 2008).

Denver refers to the following reasons for being professionally involved in videoconferencing. Sometimes it would be research. Moreover, there is a research group in New Zealand that has videoconference discussions he sometimes is involved in. But mostly concerning university processes such as selecting people for jobs. In case the applicants come from abroad the interview is conducted via videoconference followed up by a face-to-face interview later on. They have done that occasionally at his university. Additionally, he reports on rare professional participation in telephone conferences. Probably three or five times a year (Denver 2008).
Luchard demonstrates average frequency of professional participation in videoconferences. Moreover, he refers to effective integration of Skype in his online courses. From his experience this works well as long as one has an individual in the classroom taking care of the slides. He has been involved in teaching graduate courses in Computer Science basically using Skype, which seems to be an excellent tool for administrative purposes such as setting up meetings, someone discussing a program, and some teaching issues. Research seems to be more text and he thinks that the same rule cannot be applied to everyone (Luchard 2008). Due to integrating Skype in his courses and for administrative purpose it is evident that the collaborative software tool Skype is not only used for videoconferences but also for chats and making phone calls as he pointed out at an earlier stage of the interview.

Basically, Jeff Farmer refers to average frequency of professional participation in videoconferences. He just recently started to engage in private videoconferences conducting it via Skype especially when traveling. “Until now I have mostly used Skype personally for my family is in Australia. I have started using it during the last twelve months and I have already seen the advantages for work as well. So I think I will get a webcam for my lab” (Farmer 2008). Due to the advantages of integrating and using videoconferences via Skype he will use it for future collaborations with his lab as well. But there are still technical problems in developing countries concerning public access to electronic tools provided by the Internet and the World Wide Web, for not everybody is provided with high speed Internet.

Additionally, he professionally engages, but not on a regular basis, in videoconferences for conducting final exams of PhD students from abroad, and committee meetings for graduate students from other parts in Canada since his vet school has a videoconference system set up. Generally, there is no professional involvement in chats, or other types of discussion forum.

Duchamp engages in rare professional participation in videoconferences due to lack of time and laziness. He does not conduct videoconferences regularly though he likes it and used it regularly for a few months with colleagues, friends, and students in the past. Again he is not asking for many videoconferences for it is probably “the same kind of laziness I have already talked about and I am busy doing other things”. Moreover, he rarely conducts chats with some colleagues and family members. Gen-
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erally he avoids having chats with his students, for good reasons, he would argue. Having a large number of students there are always some who are likely to misuse chats for unimportant matters asking too many things, too fast and too often. For this reason he would be afraid to be solicited by students (Duchamp 2008).

Daniel Thunder participates in professional videoconferences and chats very often. He uses two effective and free online collaborative tools, [EVO] and [AccessGrid]. EVO for example, is used as a desktop for discussions in research, sharing and checking documents, using whiteboard, and conducting videoconferences. Access Grid, the second software product provides all opportunities for conducting larger meetings. Both tools work reasonably well and are used quite often. In this respect we may conclude that technology resources at Thunder’s department/school are very important. They are experimenting with new electronic tools by doing research on their usage, implementation of those and the way they affect research. They use a variety of communication tools provided by the Internet and the World Wide Web and share their entire research work by providing open access to all their research work.

Annette Pongratz demonstrates high frequency of professional participation in videoconferences and telephone conferences especially dealing with international projects. “Das machen wir einfach immer wieder bei internationalen Projekten, weil es große Vorteile hat”, says Pongratz. Moreover, she refers to the preference of videoconferences to telephone conferences in consortia. “Ich mache auch regelmäßig Telefonkonferenzen aber Video hat noch einmal die Ebene des Bildes. Gerade bei Konsortien, wo man sich noch nicht kennt, ist das ein Vorteil und unterstützend” (Pongratz 2007). In this respect, I conclude that videoconferences may not entirely substitute face-to-face communication but already provide physical presence of the person one is verbally interacting with. Therefore one may draw a picture and get more impressions of the person one is talking to. Lack of body language and lack of physical presence play a minor role when people already know each other. In contrast visibility plays a major role when talking to people for the first time to engage in collaborative processes as well as building trust.

As far as chats are concerned she demonstrates rare frequency of professional participation and finally there is no participation in discussion forums. Time is one
of the most impeding factors in dealing with electronic tools more frequently. Additionally, usability and user friendliness are factors critically reflected upon when dealing with or operating tools provided by the Internet and the World Wide Web. “Man muss sich diese Medien ja auch immer wieder erobern. Das ist eine Frage der Zeit und auch der Usability”, argues Pongratz in this respect (2007).

In contrast to most of my interview partners, Helmut Maier demonstrates frequent participation in different types of discussion forum. He argues that participation in discussion forums is time consuming but provides a high degree of learning and entertaining potentials. “Meine Teilnahme an Diskussionsforen schwankt stark. Ich bin aber in vielen Diskussionsforen aktiv und habe viel dabei gelernt. Ich habe dann natürlich auch im Internet mitgemacht. Ich finde es lustig ab und zu bei [ICQ.com] mitzumachen und sich als eine Person auszugeben, die man nicht oder nur halb ist. Aber das kostet einfach Zeit und da ist natürlich auch die Frage, ob das die preferierte Methode ist seine Zeit zu verwenden. Im Moment ist sie es nicht. Ich habe aber Zeiten gehabt, in denen ich das viel gemacht habe” (Maier 2007).

As far as videoconferences are concerned, he engages in both professional and private participation. Usage of videoconferences or Skype for private communication is predominant to professional communication for the following reasons. First of all, he considers himself traditional and conservative dealing with videoconferences for he prefers face-to-face discussions in small groups. In this respect he also refers to growing pressure in participating in videoconferences for scientists whereas in his position as a businessman he engages in frequent phone conferences he considers more effective than videoconferences because all issues may be dealt with more rapidly. But again phone conferences are no fun for him.

Second, he regards face-to-face meetings as more productive and efficient than videoconferences. Physically interacting and communicating with people not only includes elements of body language but also enables collaborating people to get to know each other much better. “Ich glaube auch, dass das viel produktiver ist. Wir haben während des Tages eine ziemlich dichte Tagesordnung und wir sitzen dann erst am Abend zusammen. Man lernt sich dann wirklich ein wenig kennen und man liest zwischen den Worten was die Leute eigentlich wollen und was sie nicht wollen. Das fehlt aber bei der Videokonferenz immer noch” (Maier 2007). In this respect he
argues that the quality of videoconferences will improve in the future but there will still be a lack of reproducing the actual atmosphere of face-to-face communication. “Für mich wird eine Videokonferenz wirklich erst akzeptabel sein, wenn sie auch die Stimmung wieder gibt. Aber auf einen Bildschirm oder eine Projektionsfläche zu starren kommt mir nicht besonders entgegen. Ich mag das nicht besonders und ich glaube, dass das ein Generationenbruch ist” (Maier 2007).

2.3.2. Remarks on Language Use and Concluding Thoughts

Summing up the descriptions of using online tools such as videoconferences, chats and different types of discussion forum we see very clearly that usage of videoconferences is predominantly used for scientific professional communication compared to chat and discussion forum. One of the main reasons I assume is that apart from technically setting up a videoconference scientists are more likely to engage in one since the differences to conversations carried out via a normal phone call are not so large. The conversation is carried out orally and even though the quality of videoconferences still needs further improvement people can see each other.

On the contrary text chat or participation in discussion forum is carried out in forms of written texts. In this respect both slow writers and non-native English speakers are highly disadvantaged. Electronically supported communication using these tools results in time pressure and thus do not provide space for critical reflections on certain scientific issues, for example, and thus are considered inappropriate communication tools for scientific discourse. They rather serve the purpose of private talks or administrative matters such as organizing meetings, making quick short decisions or exchanging ideas for discussions in face-to-face meetings. Generally they serve for exchange of informal information.

Again as far as language use in these types of online conversation is concerned scientists showing a rather low command of the Lingua Franca of the net are highly disadvantaged. Not only due to lack of capability to express one’s thoughts and ideas by presenting only small, important chunks of information but also because of the speed such communications are carried out. The worst scenario would be experienced by a person who is a slow typist and lacks proficient knowledge of the Lingua
Franca too when conducting an international chat, for example. Especially chat language or language used in discussion forum tends to be extremely short and involves usage of certain Netiquette rules as well as slang words.

In this respect I assume that videoconferences for scientific purposes will be dealt with more effectively in the future as well as used more frequently for conferences, meetings and collaborations. Concerning discussion forum and chat I conclude that especially chat will continue to play a minor role for professional activities for scientists. Both tools are appropriate tools for informal information and thus will rather be used for private purposes, student collaboration in forms of giving advice or support and collaboration with colleagues on administrative purposes.
2.4. Online Behavior

As far as the online behavior of scientists is concerned I focused on the category of membership in mailing lists, online journals and newsletters. Although a few scientists did not explicitly refer to their online behavior in their interviews I assume that membership in mailing lists and online journals exists concerning almost all of my interview partners. My assumption is based on the following factors: regular professional participation in international projects, positions as vice rector dealing with various management issues, engagement in significant projects in various areas of multimedia systems and applications such as knowledge management systems, digital libraries, electronic publishing, innovative eLearning platforms, and frequently visiting other blogs.

Generally the degree of membership in newsletters, mailing lists or online journals varies from a very limited usage to several memberships. At the same time most scientists refer to avoidance of membership in mailing lists, for example, for they are flooded with information they do not really need. In this respect Müller-Mandl refers to membership in mailing lists and online journals. At the beginning she felt very enthusiastic about that huge amount of information provided by mailing lists but finally she experiences the increase of incoming mails due to her online memberships as impediment. “Zuerst bin ich immer ganz begeistert und will informiert sein. Aber dann ärgere ich mich wieder, weil es mir meine Mailbox zumailt” (Müller-Mandl 2008).

Additionally, Simon Lenz, referring to membership in Societies for Personnel Advisory, claims that online membership results in increase of quantity of mails caused by floods of membership offers that make him refuse to engage in more online memberships. “Ich habe das Gefühl, dass da so eine Welle von Angeboten von Mitgliedschaften und Newslettern kommt. Da fühle ich mich dann gestresst. Wenn ich dann diesen 27. Newsletter von irgendeinem Xing bekomme und irgendwer möchte mit mir Kontakt aufnehmen, merke ich, dass ich mich innerlich wehre” (Lenz 2007).

Due to lack of technical knowledge in appropriately dealing with tools provided by the Internet and the World Wide Web digital immigrants seem to feel threatened by the medium computer. Additionally, when being faced with “information overkill”
they demonstrate reactions such as partial refusal. Lenz, for example, refers to emotional refusal when experiencing domination by technology in his professional life. “Dieses Medium ist ein Medium, das ich zu gewaltig erlebe. Es droht mich zu beherrschen und da habe ich dann keine Lust mich weiter darauf einzulassen. Wenn ich dann auch noch das Gefühl habe, es gibt da alle möglichen Warnungen vor Missbräuchen, Viren, die da eingeschleust werden können, da verweigere ich mich mitunter und kann mich auch zunehmend von solchen Newsletter Bestellungen wieder abmelden” (Lenz 2007).

Some other interview partners refer to personal refusal when dealing with online memberships in order to protect themselves from being flooded by mails and information they do not need and are not interested in, too. As far as membership of different websites, mailing lists, and online journals is concerned Sellers refers to no membership due to increase of quantity of mails. He argues that he does not want to get “flooded by mails” and he even asked kindly to be removed from certain mailing lists. “I have young colleagues who very eagerly want to get all kind of sources of information that I don’t care about” (Sellers 2008). In this respect age plays a critical role because in his position and at his age . . . he does not go for a career advancement anymore and therefore there is no need to use the Internet and the World Wide Web as a fighting tool for positions.

Reduction of membership in mailing lists plays an important role for Morrison as well since it results in information overload. There is simply too much good and highly interesting information out there for him. So he shifted to more intuitive than traditional scholarly methods, using [Amazon] a lot, for example (Morrison 2008). Farmer refers to membership of online journals such as the American Society of Microbiology [ASM] but to avoidance of membership in mailing lists due to increase in quantity of mails. “Mailing lists I have tried to avoid because I find that you are flooded with all this stuff which you don’t really need” (Farmer 2008).

Others report on the existence of rare membership in mailing lists. Jackson would get only a few updates from people. “I belong to a Foucault circle that sends out messages and which I could communicate more. Again, I think because I am so focused on my own work and it’s not the kind of work that requires me to open up my patterns of communication” (Jackson 2008). Most of Winter’s mailing lists are
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automatically processed and he rarely looks at them (Winter 2008). Denver reports on membership in mailing lists as he is a member of two societies in the United States, the American Psychological Association and the Academy of Management. Moreover, he belongs to distribution networks, a research methods network and a more general one. Finally, membership in some online journals exists (Denver 2008). Thaxter refers to membership in only two mailing lists (Thaxter 2008) and Duchamp on membership in a couple of mailing lists (Duchamp 2008).

To put it in a nutshell, we may say that membership in mailing lists and newsletters increases quantity of mails, technical problems such as viruses and thus to experiences of being threatened and dominated by technology is very likely to occur. In this respect scientists demonstrate a strong tendency to engage in refusal, such as reduction of memberships, very carefully focused engagement, delegation of mails from mailing lists to assistants or total avoidance of becoming a member.

2.5. Online Teaching

2.5.1. General Description

In order to describe the impact factors on the transformation process concerning teaching I concentrated on three categories and subcategories respectively. Online teaching only, traditional teaching only, online and traditional mixed. Generally I conclude that most scientists have not shifted from traditional teaching methods to online teaching. Most of them do not engage in online courses, some of them are involved in both online and traditional teaching, a few mainly teach traditional courses with integration of some online components and some do not deal with online teaching at all but would provide teaching material for students on the official website. Only one of my interview partners mainly teaches online courses and rarely integrates traditional teaching elements in his courses.

What are the main reasons for scientists to maintain their traditional teaching methods rather than implementing and using electronic tools for students’ instructions? The following reasons are referred to as impact factors for no or rare involvement in
online teaching. First, lack of technological knowledge to efficiently operate online teaching tools as well as learning management tools not only increases time pressure but also results in intensive workload for scientists as digital immigrants. Second, face-to-face meetings are regarded as an essential part for successfully teaching students as well as physically interacting with them. Third, age and closely related generation gap are reported on as critical factors for predominantly using traditional teaching methods. Fourth, there is no necessity since the university or the department is not specializing on distance education. Fifth, certain fields in science benefit from online courses more than others since for some fields online teaching presents an appropriate tool whereas for others it rather causes an impediment for students’ progress as well as student teacher interaction.

Duchamp engages in traditional lectures only referring to two main reasons for not being involved in online teaching. First of all organizational reasons as his university just integrated an institution specializing on distant education two years ago. People working in that institution were the experts, other departments did very little in that field and Duchamp was involved in that “a little but as a designer of the course more than giving a course” experiencing an intensive workload. Second, he prefers to be in the class for he wants to see his students laugh when he makes a joke, for example. Additionally, he regards face-to-face teaching an important factor in teaching for face-to-face meetings with students provides students’ feedback on understanding and impacts of instruction issues to a higher degree than would be possible by online teaching (Duchamp 2008).

Accordingly, strong preference for performance in the classroom plays a highly important role for Alberta Jackson, too. As far as teaching students is concerned she would only engage in traditional lectures due to her skepticism about the value of pedagogies that are more separated and disembodied for the interactive type of teacher she regards herself to be enjoying performance in classroom. Apart from face-to-face interaction as essential requirement for her teaching she points out that she has not been forced into “exploring the potentials of the web” because they do not do distance teaching. Moreover, she still lacks knowledge on what is possible using certain tools for teaching as well as operating learning management systems (Jackson 2008).
Lack of technological knowledge on using and operating learning management systems and online teaching tools is a further important impact factor for not getting involved in online courses for scientists. In this respect Müller-Mandl, who only engages in traditional teaching, takes the following reasons into account for not dealing with online courses so far. First, lack of knowledge on operating online teaching tools. Second, lack of time to engage in training courses to acquire appropriate technological knowledge. “Das Aufgabenfeld ist derartig vielfältig bei mir und ich bin zur Zeit so überlastet, dass ich mir diesen Luxus nicht leisten kann” (Müller-Mandl 2008). Third, generation gap is reflected upon as impact factor, too. “Wir hätten hier die Möglichkeit. Es wird alles angeboten. Aber interessanterweise machen es hauptsächlich die ungefähr zehn Jahre jüngeren Kollegen und Kolleginnen. Allerdings jammern alle über den Aufwand des Ganzen” (Müller-Mandl 2008).

Generally, Müller-Mandl regards online teaching positively and would engage in online instruction with technical support from other people as well as total or partial delegation of certain issues. One of the main reasons she argues is her strong tendency to perfectionism. “Ich käme dann wieder in Konflikt mit meinem Perfectionismus. Es würde mich noch viel mehr Zeit kosten als jemand anderen, weil ich das alles so absichern und genau machen würde.” Apart from perfectionism she refers to her age as another impeding factor on online teaching. “Wenn ich jünger wäre, würde ich wahrscheinlich das andere lernen und es wäre alles anders” (Müller-Mandl 2008). In order to protect herself from one more workload she has decided to remain in traditional teaching. “Ich habe mich inzwischen dafür entschieden die Lehre als Person und als Persönlichkeit zu gestalten. Da ist auch manchmal ein falsches Wort möglich, das muss nicht alles ausgefeilt sein. Da vermittele ich mein Wissen, was mir wichtig erscheint, auch in der Reaktion auf die Situation hin. Das ist mein Lehrstil und den glaube ich werde ich behalten” (Müller-Mandl 2008).

Others like Sellers do not engage in online teaching since in his comparatively small department there is no need for online courses. In this respect he refers to online communication as an effective tool for his colleagues who teach large classes and have to deal with, two, three, four hundred students. They use [WebCT], he considers a very convenient tool, for online instruction. For this reason he started to learn how to operate WebCT but finally gave it up for both retiring soon and its labor intensity. “So I was not really interested in going into it any more” (Sellers 2008).
2. Analysis of Interview Data

As I already mentioned at the beginning of this section online courses are effective tools for teaching students in some scientific fields whereas in fields based on face-to-face interaction, reflections and argumentation it may result in a lower degree of quality of lectures and instructions. Concerning teaching Liebminger engages in traditional teaching only. In this respect he refers to quality of his lectures as well as to the main methods in Philosophy or philosophical studies. “Ich glaube, dass es viele Bereiche und Fächer gibt in denen der Einsatz von E-Learning oder Blended Learning sehr sinnvoll sein kann. Meine Auffassung von Philosophie, die Wissenschaft, die ich hier vertrete, ist die, dass es zwei wesentliche Methoden und Grundlagen in der Philosophie gibt. Das ist der Text und das ist das Gespräch. Ich glaube, dass man beides online nur schlechter machen kann als offline. Nachdem ich nichts Schlechtes machen will, mache ich es lieber gleich in Wirklichkeit” (Liebminger 2008).

Some of those interview partners who do not offer online courses would integrate online parts into their traditional teaching courses and delegate these digital parts. Irving Winter, for example, is still teaching traditional lectures himself. Small online components are integrated in these traditional lectures, but he does not teach them and delegates these online components to other people (Winter 2008). Others like Lacroix would integrate the Internet in some of their courses providing an outline of the problem requiring students to go online for more details, more precise definitions or illustrations (Lacroix 2008).

Although Farmer generally is not involved in online teaching and predominantly teaches traditional lectures, he has experienced the great potential for effective collaboration with students making use of communication tools provided by the Internet and the World Wide Web. Normally, as a researcher his teaching load is rather low and mostly with graduate students face-to-face. There is one tutorial type of course focusing on problem based learning with undergraduate students. They work in groups and everything goes on to the web whereas the actual teaching part is done face-to-face. In contrast, usage of the web plays an important role in one of his teaching areas for enabling and facilitating synchronous distance collaborations with students from abroad. The procedure for these student collaborations is described as follows: international students come to Quebec to do a lab part in face-to-face communication. Due to tools provided by the Internet and the World Wide Web they may continue their work on a particular experiment in the other lab when
returning to their home countries. They take photos of their work, scan these and send them to the professor in the other lab via Internet. In this respect Farmer refers to the possibility that on the same day he can see what they have done in the lab there. “So basically we are working at distance and there is a big research element there. Now due to the web we can do a part of the work here and a part of the work there. We do a part in Australia and in Asia, for example, and it is almost simultaneous what we are doing” (Farmer 2008).

Synchronous distance collaborations with students involved in lab work, writing papers or their thesis has strongly affected his work, research and part of teaching. “We couldn’t have done that ten years ago and that I think is really one part that has totally revolutionized our work. For me it is both work and research. Concerning teaching for me that basically is my teaching at distance” (Farmer 2008). In this respect it becomes clear that especially in the field of Natural Sciences using electronic tools results in highly effective synchronous distance collaborations with both international students and international researchers. Students working on experiments in the lab can be easily monitored by their professors even at long distances. Additionally, professors may provide instant, synchronous feedback or evaluate a student’s work through different channels of online communication. Email correspondence, videoconferences, whiteboards or any other electronic collaborative tool, for example. Moreover, as far as online teaching is concerned Farmer mentions that he is following a [WebCT] course to gain experience with this type of courses he considers will gain importance in the future.

Morrison mainly engages in traditional lectures and has never totally worked online with students. With a couple of doctorate students he effectively worked online basically via email and attachments. Additionally, they had meetings at conferences and occasional phone calls. Integrating the usage of Skype for virtual collaboration was difficult because university firewalls caused a lot of problems. Totally engaging in online teaching would be possible at his university as all technology resources are provided, but he prefers to build relationships with his students face-to-face before going further (Morrison 2008). In this respect Morrison, like almost all of my interview partners, refers to integration of face-to-face-meetings as an important factor for successful collaboration in teaching and research.
In contrast for Luchard online courses are his primary mean of teaching and he is rarely involved in traditional teaching. “My primary teaching platform is really the web. I do teach face-to-face from time to time. Sometimes I enjoy it. But I would be sad to teach face-to-face all the time. I enjoy much more online teaching these days” (Luchard 2008). Synchronous time is a critical factor for Luchard as he regards it more expensive than asynchronous time. For this reason he entirely avoids the phone and prefers teaching online to face-to-face teaching. Synchronous time activities cause distraction for him. In contrast to all the other interview partners Daniel Luchard predominantly teaches online courses and he prefers teaching online to traditional forms of teaching. Most of my interview partners are not involved in online teaching and predominantly teach face-to-face courses for they want to physically interact with their students.

In this respect, we may conclude that preference for online teaching is based on the following factors. Having reached a highly advanced status of technological knowledge and having already turned into a digital native as far as using and operating electronic tools are concerned, intrinsic motivation to use new online teaching tools and experiment with those is much higher than with digital immigrants. Most of my interview partners belong to the group of immigrants. There is no indicator according to my interviews that the field is a motivational factor for teaching online courses. Most computer scientists among my interview partners, Luchard is the only exception, are not or rarely involved in online teaching. Moreover, generation gap and lack of knowledge on online instruction tools are further impeding factors to totally engage in online courses.

Preparing online courses is time consuming and results in a huge workload especially in the beginning. So this could be another factor for preferring traditional teaching courses. Finally, lack of body language and lack of face-to-face meetings contribute to neglecting or only partially integrating virtual forms of teaching in one’s courses. Concerning electronic tools Luchard refers to using all sorts of tools. He makes intensive use of [Wikis] both for research and management issues. As a team of professors they set up a Wiki often preparing a program and discussing it there or when doing research with people. Additionally, he would use it for collaborating with graduate students for he does not require them to be in the laboratory
physically. His students and coworkers can be anywhere and therefore he does not need lots of room at university (Luchard 2008).

Daniel Luchard demonstrates a strong preference for what he calls micro collaboration and micro research. He tends to work in small bits at a time and other people collaborating with him contribute small bits each time using collaboration tools such as [Wikis], [Google Docs], online Office Suites [Ericson 2007]. The basic collaboration procedure for micro collaboration is described by Luchard as follows: “Basically I would take the document out and work on it, put it back on the server so that people then who want to edit can actually do it from this site. This can be done ten times a day and you can monitor what other people are doing. So I basically subscribe to RSS Feeds and then I see the changes that people make. Similarly with Wikis the great thing is that you can monitor Wikis with [RSS] Feeds and you can see what people are doing. That avoids emails. So it is possible for me to say okay we are just going to write a paper on this topic. Here is where the paper is and we start this paper. So once the agreement is reached then we never send an email any more until the paper is finished. Then once the paper is finished we submit it” (Luchard 2008). The entire process of creating the paper is done through micro communication, kind of quantum collaboration. Using quantum elements that you basically send back and forth. According to Luchard micro collaboration for doing research will become an important factor in the future.

Finally some scientists engage in both forms of teaching traditionally and online. In this respect Annette Pongratz remarks that learning management systems such as [Moodle] currently used at her university provide a higher degree of user friendliness than former ones. At the same time she would like to increase this user friendliness and desires reduction of passwords to one in order to get access to the areas needed. “Ein integrierter Zugang. Es muss immer sicher gestellt sein, dass ich ein Passwort für alles verwenden kann. Das ist, glaube ich, ganz extrem wichtig. Alle diese wirklichen Nutzerfreundlichkeiten” (Pongratz 2007). Here we can draw the conclusion that management of different passwords as well as usernames is still considered problematic by scientists who are digital immigrants. For this reason a higher degree of user friendliness as referred to by Pongratz forms a further impact factor for getting involved into online teaching or operating electronic communication tools in general.
2.5.2. Concluding Thoughts

When drawing conclusions on the category online teaching it becomes obvious that traditional teaching courses are still predominant. Face-to-face interaction with students in the classroom is still regarded as a basic requirement for both effective and high quality teaching. Most scientists still critically question the benefits and the value of eLearning for their students who form the future generation of the young academia. Additionally, the benefits of implementing online teaching into the curriculum seem to differ from field to field. Scientists of Natural Sciences can use communication tools for teaching purposes more efficiently than those of the Humanities. Online collaborative tools are experienced as excellent tools for synchronous collaborations with students worldwide in Natural Sciences whereas in Humanities they are less integrated into teaching since the focus is on communication, argumentation and critical reflections on scientific issues. For this reason, fields in Humanities are still lagging behind in implementing electronic communication tools in their curricula.

Moreover, face-to-face meetings when teaching and collaboratively interacting with students are considered basic requirement for quality issues and sustainability. I assume that most scientists integrate online parts in their courses as well as combine traditional teaching with online elements to facilitate effective collaboration with students worldwide but show a strong preference for traditional teaching to engage in discussions and scientific argumentation in class. In this respect using communication tools provided by the Internet and the World Wide Web may negatively impact quality of scientific work or scientific argumentation. I will discuss these negative impacts more explicitly in Chapter 3.

Universities have already effectively implemented Learning Management Systems such as Moodle, Blackboard, WebCT or other kinds of learning management systems into students’ courses and thus scientists as instructors will be forced to deal with online teaching more in the future than they were in the past. Group pressure is very likely to rise for those trying to resist technology. Lack of opportunities to delegate online teaching parts to assistants and staff people will force them to become involved in online teaching to a greater extent than desired by themselves. But on the other hand, experiencing the advantages of online teaching will cause a higher
degree of intrinsic motivation for shifting from traditional teaching to online teaching, although face-to-face elements will stay basically required elements that need to be integrated effectively into online courses.

2.6. Digital Publishing

2.6.1. General Considerations

According to the qualitative analysis of my research study it is obvious that most scientists have not totally shifted from traditional publication tools to electronic ones. There are some who demonstrate a total shift to electronic publication tools for their scientific work whereas others predominantly or totally use traditional publishing tools. Most of my interview partners use both traditional and online tools but there is still a strong tendency to predominantly publish traditionally rather than electronically. In this respect some scientists would only publish in a few online journals and the main part of their research work is published in printed forms such as books.

In order to be able to describe the impacts of the Internet and the World Wide Web on the transformation process of scientists concerning publication tools I concentrated on the following categories and subcategories respectively: traditional publication, digital publication, and electronic reviewing system. Moreover, I integrated the category Learning Management Systems since some of the interviewed scientists reported on texts they would publish for their students on websites as well as provide these for download in Learning Management Systems. I am aware that the last category plays an important role for both online teaching and digital publishing but I decided to discuss it in this chapter since some scientists do not operate these tools on their own and simply delegate the task of uploading their texts to assistants.

When discussing different types of digital publication I generally refer to online journals, online magazines, texts provided on websites for public access and I am not focusing on eBooks, for example, since most scientists still publish their books in printed versions. Generally the shift from traditional publication tools to digital ones is a steadily progressing one. Although there is a group of scientists still engaging in
traditional publishing most scientists are already aware of the importance of web presence and digital publications in order to gain international reputation in their fields. At the moment fields in Natural Sciences or Technical Sciences, for example, do benefit more from digital publications than those in Humanities or Social Sciences. But this gap I assume is very likely to disappear in the near future due to group pressure as well as due to the number of scientists showing a good command of operating technology rapidly growing. As soon as these transitional stages have been passed through, traditional publication tools will be almost distinct and play a minor role in science I would assume.

Which transformation processes are experienced by my interview partners concerning publishing scientific work and what are the main reasons for them to predominantly stay with printed publication rather than electronic ones? Why have some already totally switched to electronic forms of publication in order to publish their work? Which factors make them engage in both types of publication?

Acceleration and facilitation of publishing research work due to digital publishing tools are considered great advantages when shifting from traditional tools to online ones. Dealing with publications Duchamp is still involved in both traditional and electronic forms of publications. The guide to XY-Software, Roland Duchamp is part of the editorial team, for example, is available as pdf on the web and in book form in different languages. Being part of the editorial team of the XY-Software guide he experiences the shift from traditional publication tools to electronic ones as facilitation as well as accelerating publications. “It makes such publications much easier and faster” and “it’s also the dynamics of the projects”, Duchamp argues (2008).

Moreover, steadily rising number of online journals and declining quantity of traditionally published journals is reported as one of the major reasons for engaging in online publication. Pongratz, for example, publishing online as well as traditionally refers to the fact that some journals are only published as online journals. “Manche der Zeitschriften erscheinen nur noch online. Vor kurzem habe ich so ein Heft gemacht, das ist einfach nur noch online” (Pongratz 2007).

As far as Thunder is concerned both forms of publication are used. Considering electronic publication he mentions that you are the sufferer of what one manipulates. It
is impossible to stop traditional forms of publications and totally shift to electronic ones immediately. So researchers end up doing both. Moreover, one gets more interest, more response from the web based part of one’s work than from the traditional one. If the purpose of publication is to disseminate, get feedback and enter discussion, then the new media credit that much more than the old one (Thunder 2008).

Concerning digital publication they use various websites like the [brcss.net Site Profile: Building Research Capability in the Social Sciences Network] website and the [SSRC] website to post material. Moreover, their research is put up on a site as well.

Additionally, introduction of the quality assurance system now in New Zealand has an impact on the type researchers publish. At most universities researchers get graded on what they produce and so they have to be careful where they publish their work. The quality control systems do not grade traditional and digital forms the same way. Some are more traditionally oriented, others emphasize new forms (Thunder 2008).

Maier demonstrates both traditional and online publications. In this respect he refers to the electronic Z-Journal, a high quality electronic publication dealing with all aspects of computer science, founded by him and his department fourteen years ago. It has been appearing monthly since then and is thus one of the oldest electronic journals with uninterrupted publication since its foundation. From the very beginning he successfully aimed to reach a compromise between traditional and electronic journals in the following sense: “Jede Arbeit wird von drei Gutachter bzw. Gutachterinnen bearbeitet, ein ganz normaler Begutachtungsprozess. Die Arbeiten erscheinen aber zuerst elektronisch und auch der elektronische Begutachtungsprozess beschleunigt den Durchsatz. Aber am Jahresende erscheinen dann die Sachen als gebundene Bände. Ich halte diesen Ansatz, dass zuerst die elektronische Zeitung kommt und dann nur zum Drüberstreuen die gedruckte Version für Archive, für sehr viel zeitgemäßer als das was die meisten Verlage tun. Sie haben eine gedruckte Zeit- schrift und die gibt es auch in elektronischer Form” (Maier 2007).

Like other scientists Maier criticizes the money driven policy of publishing houses trying to maintain printed versions of publications and offer the electronic ones as additional service. He argues that with most journals it works as follows: “Wenn Sie nur die elektronische Version bestellen, was Sie können, zahlen Sie 90% von dem was
2. Analysis of Interview Data

Sie zahlen würden, wenn Sie die elektronische und die gedruckte bestellen. Die elektronische allein ergibt keinen Sinn, wenn man mit ganz wenig Aufpreis die gedruckte noch dazu bekommt” (Maier 2007). In this respect he considers himself a revolutionary who wants to demonstrate to publishing houses that they need to change their philosophy on publishing policies.

From his point of view, scientific journals should be primarily published electronically. Moreover, printed versions should exist due to archiving issues and tradition. Concerning the Z-Journal he points out that “aus verschiedenen Archivierungsgründen und vielleicht auch aus der Tradition heraus, sollte durchaus so etwas wie eine gedruckte Version existieren. Ähnlich wie wir das tun. Nachdem zwölf Nummern erschienen sind, wie ein Buch gebunden. Dieses Prozedere ist vernünftiger und verbessert den Zugriff zu Materialien” (Maier 2007).

In this respect he refers to the constantly as well as rapidly growing amount of information and draws a parallel to the American tradition of publish or perish, the pressure to constantly publish work in order to advance or sustain one's career in academia, and that he, his colleagues, and assistants at the department act similarly. Whenever there a new idea occurs, they immediately start developing and working on it. Finally there exists “ein Arbeitsband, der für eine Zeitschrift gerade die richtige Länge hat. Der wirkliche Neuheitsgehalt beschränkt sich aber auf zwei Absätze. Das hat bei mir dazu geführt, dass ich mich mit der Idee spiele, ein Journal of Pearls zu kreieren, wo wir das Gegenteil machen und sagen, dass eine Arbeit prinzipiell nicht länger sein darf als eine dreiviertel Seite.” At the moment he is not sure whether he is going to put the idea of the Journal of Pearls into practice or not, though concerning himself he has planned to condense his publications of the last ten years into “pearls”.

Journals of Pearls, for example, could easily substitute proceedings at conferences argues Maier. “Ich glaube, dass ich die Ideen meiner zweihundert oder dreihundert Arbeiten, die ich in den letzten zwanzig Jahren geschrieben habe, auf hundert Seiten kondensieren könnte ohne dass eine wesentliche Idee unter den Tisch fällt. Ich glaube nicht, dass das nur für mich gilt, sondern dass das allgemein gilt. Es wäre eine nette Idee, wenn man auf einer großen Tagung anstatt des dicken Tagungsbandes die “Pearls of this conference” erhalten würde. Das wären so dreißig Seiten und auf
2. Analysis of Interview Data

jeder Seite habe ich ein Aha-Erlebnis” (Maier 2007). In this respect he argues that on the one hand condensing content would contradict scientific tradition and therefore negatively affect a scientist’s reputation, but on the other hand he regards condensing content to pearls as an important factor concerning knowledge management.

Additionally, Maier, like all interview partners, refers to a total shift from traditional forms of data research to searching for material online. Digital libraries have almost substituted traditional ones because electronic availability of scientific journals, scientific papers and material for doing research may be easily accessed from the office. There is no need to physically go to the library resulting in the fact that traditional libraries are superfluous for a scientist’s work. “Unsere Bibliothek steht eigentlich leer. Der Grund dafür liegt darin, dass die Zeitschriften und wissenschaftlichen Arbeiten elektronisch verfügbar sind. Da sehe ich keinen Grund hinüber zu gehen und mir eine gedruckte Zeitschrift auszuleihen, die ich mir dann vielleicht noch kopieren muss. Da gehe ich natürlich auf die elektronische Version und drucke sie mir aus, wenn es interessant ist” (Maier 2007). In this respect he assumes that the scientific field presents a critical factor in totally or frequently using electronic tools for searching for scientific data and material. As far as technical sciences are concerned he experiences a strong tendency to accessing electronic sources whereas historians or ethnologists need to access documents, original sources and printed volumes for their research work.

In this respect Liebminger argues that the availability of digital publications has strongly influenced data research and the way scientists deal with texts. “Die Recherchearbeit, die sich früher fast ausschließlich in Bibliotheken abgespielt hat, findet jetzt zum Großteil d.h. primär über das Netz statt. Wenn man wirklich dort nichts findet, geht man doch in die Bibliothek. Das hat sich schon stark geändert” (Liebminger 2008) On the contrary he describes his personal publication habits as “bewusst konservativ”. Liebminger argues that he prefers traditional printed versions of newspapers, anthologies, scientific journals and books. “Ich schätze das klassische Buch als Hauptmedium für mich nach wie vor. Ich schätze die wissenschaftliche Zeitschrift, die noch in Papierform erscheint und nicht nur in digitaler” (Liebminger 2008). As far as publishing of his research work is concerned traditional publications are still predominant but he is aware of the progressing shift from traditional publications to electronic ones. “Wahrscheinlich wird man sich dem bestimmt nicht
2. Analysis of Interview Data

entziehen können in dem Maße wo immer mehr Medien nur in elektronischer Form erscheinen. Dann wird es natürlich auch von mir Texte geben, die nur mehr in elektronischer Form vorhanden sind” (Liebminger 2008). But until now traditional publications have been predominant. Some digital publications exist but are, unlike the texts provided on his website, not explicitly referred to.

Two main reasons are taken into account for scientists who still publish only in the traditional ways. Some have not shifted to digital forms of publications since they write and publish books or publish in journals of which they are editors themselves. They would not resist digital forms of publications out of principle but rather due to predominance of traditional publishing in their field. So far Lenz has never published in an online journal and he considers himself very traditional and conservative concerning his publications. “Im Hinblick auf Publikationsorgan hat sich noch nichts verändert”, he argues. “Da bin ich tatsächlich noch konservativ aber nicht aus Prinzip, sondern einfach, weil ich in der letzten Zeit eher Bücher oder in sonstigen Journals, deren Mitherausgeber ich zum Großteil bin, publiziert habe“ (Lenz 2007).

Others have already decided to continue publishing their work traditionally. “Das ändere ich sicher nie. Dazu ist mir das Medium zu lieb“, states Friesacher (2009).

Winter and Müller-Mandl are still following traditional forms of publication. Traditional publications are predominant. Most publications are printed at hand, but Winter publishes a few online articles in online journals too. “Of course I have some publications in online journals and so on. But I am still pretty traditional in how I publish” (Winter 2008). Müller-Mandl states that traditional publications are predominant but some online publications would exist, too. “Wir publizieren alles weitestgehend auf die klassische Weise. Ich meine unter vielleicht hundert Titeln sind bis jetzt zwei oder drei Internet Titel. Und es kommen selten Anfragen in einer Internetzeitschrift zu publizieren” (Müller-Mandl 2008).

Sellers is still engaging in traditional forms of publications stressing on MacLuhan’s theory (McLuhan and Fiore 2005). The prime example today is that despite the electronic world there are more books sold than ever before. So several media may exist simultaneously. He reflects on shifting from traditional publications to electronic ones as a very slowly progressing transformation process. Digital publishing tools provided by the World Wide Web and the Internet affected his types of publications.
as well. Being a member of the Canadian Society for the Study of Rhetoric [CSSR] he experiences the benefits from digital publications as all members of this society decided about half a dozen years ago to put everything on the website. For this reason the Internet and the World Wide Web enable forms of publications that could never have been done in the traditional way because conventional printing would be too expensive (Sellers 2008). In this respect it becomes clear that digital publishing reduces publishing costs compared to traditional ones.

As far as digital publications are concerned, the Internet or the World Wide Web had no impact on the type of publications of some interview partners. Traditional publications are predominant for Lacroix. But like others he is engaged in online reviewing doing evaluations for submissions for a couple of online journals. Morrison also referred to electronic reviewing as using the Public Relations Review Editorial Board [Elsevier] where everything is done online (Morrison 2008).

In this respect Denver points out that apart from online submissions he has not experienced a major shift in terms of the mode of publication. The procedure of submitting articles now is a bit different to the way it used to be as you can submit articles online whereas in the old days one had to send copies or mail them to the editor of the journal. Nowadays you can submit online and that is probably about the only change, Denver argues (2008). As he does a lot of reviewing for different journals he has experienced the shift to an electronic reviewing system. It is all done by electronic communication, which has pros and cons from Denver’s perspective. Occasionally he has experienced technological difficulties such as not being able to download an article or to get onto the website properly. Sometimes the procedure for logging in and getting to the place may be difficult. But generally it is much quicker and very efficient. Alberta Jackson is reviewed by quite a few numbers of international journals and she too enjoys the efficiency of that mechanized review systems on responding to, collecting and commenting on articles (Jackson 2008).

“I am still in the traditional mode”, Jackson claims on traditional publication tools first and then points out that there are a few online publications on websites. She provides an online workshop for indigenous students in New Zealand and has conducted three workshops on different aspects such as literature reviews, structuring in academic work, and how to write a good paragraph so far. Her articles are pub-
lished on a special site where her students can “click on to that and get the notes” she would provide for them. Moreover, [CECIL] a Learning Management System is used for providing material, information and communication exchange with students. Due to a lack of proficiency in operating the uploading of material on that site it is mainly delegated to an assistant. “We put overheads, handouts and notices for the students on this site where they can go and communicate with us. I am not very good on using that and I tend to get my assistant to put everything on that site for me” (Jackson 2008).

Democratization of knowledge and journals offering rapid electronic submission are two critical factors for totally shifting to digital publication tools. Peter Thaxter demonstrates a total shift from traditional forms of publications to electronic ones for the benefits of public access. Personally, he has made the decision not to publish any more books. Only in case an important publisher would like to publish one of his online publications in book form he would probably agree. In his opinion, his work should be available for everybody online and free. Public access is especially important for developing countries for normally it is impossible for them to take part in debates or collaborations on accounts of ordinary costs. Thaxter points out that he has many subscribers from Latin America and people in Asia. “If you live in Uruguay, Chile or Mexico you cannot possibly afford even a student rate of a hard copy publication. So, you know, it’s an active equality and fraternité et égalité to put knowledge online and make it freely available” (Thaxter 2008).

Like Peter Thaxter, Jeff Farmer demonstrates a total shift from traditional forms of publications to digital ones. Now all publications are basically done electronically for most of the journals they publish in offer rapid electronic submission. “Publishing we do basically online now and for reading I don’t print anything any more. I get it directly from the journals” (Farmer 2008). Concerning reviewing papers he has shifted to online reviewing tools for everything can be done through the net, even submitting photos.
2.6.2. Concluding Thoughts

To put it in a nutshell, it is obvious that scientists have shifted to using electronic publication tools to various degrees. On the one hand data research is totally based on online journals for searching for articles, for example, but on the other hand scientists are slowly progressing in electronic publications for online journals and magazines. Since most scientists predominantly engage in traditional modes of publication I conclude that the transitional stages when shifting from traditional publication tools to electronic ones are likely to take longer than transitional stages on other online communication tools I have already discussed in the previous chapters. As far as electronic publication is concerned group pressure seems to be less active and scientists may voluntarily decide whether or not to engage in electronic publication. Moreover, publishing books is still done traditionally since eBooks do not play a critical role in science so far. But this, I assume, will change in the future.

2.7. Scientific Reputation

2.7.1. General Description

In the following chapter I am going to deal with the impacts of electronic publications on the scientific reputation of my interview partners. Which role does the Citation Index play for scientists in general? Are citations already used as a fighting tool within the field of science? Are citations or electronic publications already dealt with as relevant measurements for scientific quality and a scientist’s reputation respectively nationally and internationally?

Checking [Science Citation Index] as a measuring tool and usage of Citation software (search engines for citations) are the categories respectively subcategories I concentrated on when analyzing the impacts of electronic publications on scientists’ reputation. Generally there is a visible shift from counting publications to counting citations in the field of science. Citations have already turned into measuring tools for scientists or their scientific work and the Citation Index already plays a dominant role for scientific reputation. My interview partners are aware of this shift but
view Citation Indexes from different degrees of importance as well as different perspectives. Some interviewed scientists claim that the Citation Index measures a researcher’s reputation better than the quantity of publications and is therefore regarded as a highly important factor for scientific reputation. In contrast, there exists a group of scientists who do not care about Citation Indexes as for them these are ineffective tools for ratings in science. Others would hardly check Citation Indexes because they have never been believers in counting publications and thus pay less attention to citations as measuring tools concerning quality in research.

As far as software for checking Citation Indexes is concerned [Google Scholar] and [CiteSeer] are predominantly used by scientists. According to Maier, citations are important factors in science and he regards citations as measuring tools for a scientist’s reputation. Citation software such as CiteSeer, a scientific literature digital library and search engine primarily focusing on literature in computer and information science, play an important role for him as a scientist. “Zitate sind uns sicher wichtig. CiteSeer wird von mir und auch von den anderen relativ ernst genommen. Das hat aber mit der Elektronik nur relativ bedingt zu tun. Wenn ich eine Arbeit in einer wissenschaftlichen Zeitschrift schreibe, die von CiteSeer akzeptiert ist, dann ist es für mich schon wichtig, dass die Arbeit nicht nur gelesen, sondern auch zitiert wird” (Maier 2007).

Apart from citations as measuring tools Maier considers web presence as one more dominant factor on reputation as well as international collaborations. According to him a high degree of professional web presence results in steadily growing requests for international collaborations or PhD students from abroad. “Ich glaube schon, dass es vernünftig ist, dass jedes Institut eine professionelle Webdarstellung hat. Viele meiner auswärtigen Anfragen von Studierenden bezüglich Diplomarbeit oder Doktorat kommen über das Web. Sie holen sich alle Informationen über die Webseite der Universität, des Departments und die wissenschaftliche Expertise der Professoren und Professorinnen ebenfalls über deren digitales Profil. Die High Commission of Pakistan kennt mich nur aufgrund meiner Web-Präsenz. Junge Professoren und Professorinnen bei uns, die noch nicht so lange im Web sind, sind in Pakistan noch gar nicht als Supervisor und Supervisorinnen anerkannt” (Maier 2007).
Referring to Maier’s professional experiences, it becomes clear that not only high professional quality but also duration of web presence and Citation Index present critical factors for a scientist’s reputation abroad. “Das sind zum Beispiel bei uns in der Informatik von den zwanzig Habilitierten vielleicht vier oder fünf Anerkannte. Und das geht schon zurück auf Citation Index, Publikationslisten, Vorträge und professionelle Darstellung im Web. Diese Darstellung, die ich von mir abgesehen von den Bildern auf meiner Webseite habe, ist einfach eine Reklame für mich. Das ist eben eine PR-Tätigkeit und diese PR-Tätigkeit führt schon dazu, dass man zu bestimmten Sachen kommt. Diese Außendarstellung im Netz ist nicht überflüssig und ich glaube, dass man das schon braucht” (Maier 2007). For this reason the conclusion can be drawn that professional web presence is already used as a fighting tool for positions and career advancement in the field of science for it provides public access to a scientist’s publications, portrays his/her professional expertise, increases the number of international collaborations as well as citations of publications.

Accordingly, Luchard has already switched to Google Scholar, a “beautiful” tool that enables one to browse lots of papers and it is mostly electronic. So he publishes himself, tries to cater for people to read his work electronically. He assumes that they will not have a paper copy of his work and that this does not make him a highly successful scientist, but it makes him more successful (Luchard 2008). Here we can see very clearly that Luchard has already shifted from counting publications to looking at citations using Citation software such as Google Scholar. He belongs to the group of interviewed scientists that consider Citation Indexes a highly effective tool for measuring a researcher’s reputation.

Moreover, he argues that scientists on the one hand are still too fixated on paper format but on the other hand more and more papers are available online. So there exists a visibly growing shift from traditional forms of publications to digital ones. If scientists want their papers and research work to be read by more people all over the world, they are required to engage in electronic publishing. Electronic publications are necessary as more people get access to a scientist’s work and therefore result in rising reputation within the field of science. In this respect we may conclude that electronic publications have already become an impact factor on reputation in science. Therefore, from Luchard’s point of view authors have to work on being more easily accessible. Those scientists who do not care about digital publishing are very
likely to give the impression that they do not care whether their papers get read or not. They only want to add a line to their CV or say I have published at the conference for the conference is the only thing they want to sell their proceedings on (Luchard 2008).

Irving Winter who has already shifted from counting publications to counting citations mentions that there is the “fantastic difference” between counting publications as in the “old days” and “now” how people look at citations. When checking Citation Indexes, he uses the H-measure (Hirsch 2005) quite a lot when looking at other people in the field of science. In this respect he claims that he “thinks that the world is changing from counting publications to looking much more closely to citations” and that in his “opinion citations are a very good measure of someone’s influence, much better than the number of publications” (Winter 2008).

The Citation Index has already become an effective measuring tool in terms of quality of a researcher’s work. Indeed most scientists are in the process of shifting or have already shifted from counting publications to looking at citations as citations have more accuracy as well as more influence in research. Winter refers to problems with “both things” but he thinks that “citations properly used are more accurate in research and are much more influence than a collection” (Winter 2008).

In this respect, Thaxter comments that electronic publications have already affected his reputation on both national and international level. From his professional experience citations have become measuring tools for scientists and the Citation Index is gaining importance for scientific reputation. In his opinion digital publications are not so important to reach a certain position within one’s field in a short-term strategy. But from a long career history point it definitely will. Younger researchers trying to build up a career still need to publish in conventional peer reviewed journals to gain reputation at their university. According to Thaxter this is counterproductive because the needs of the world community have changed with the advanced technology. In the long run he argues they will be better off to publish online to get themselves a reputation elsewhere (Thaxter 2008).

Following the arguments above I draw the conclusion that digital publications and citations are already important factors in a scientist’s career and thus have already
turned into fighting tools to reach certain positions in the field of science. Members of the old academia may still regard digital publications and citations as nice-to-have tools for gaining reputation whereas the younger academia is required to use these tools as basic and standard ones in order to build up a scientific career. The younger academia is already faced with group pressure caused by technology whereas the old academia may totally or partly resist. Most of my interview partners do not seek career advancement any more since they have reached top position in their universities or in their fields of science respectively. Additionally, some do not value Citation Indexes as important quality measuring tools for scientific work.

Lacroix, for example, mentions that he is not cited so much for digital publishing. But a lot more people know him and his work and apparently respect it and then cite him. Since he considers the Citation Index of low importance for scientific reputation he has never actually checked it for his citations. In his position as full professor he is not getting any further promotion for he is at top of the system already. So he pays less attention to the Citation Index as a measuring tool for a scientist’s reputation. In contrast people who came into the system in the last ten or even five years are faced with citations as measuring tools concerning reputation in research. Lacroix argues that they have to be entrepreneurs of their images that include a lot of web and online activity. “A lot more than people of my generation do or even would have done perhaps because like I said that the definition of what is considered research has changed” (Lacroix 2008).

Generally we may argue that digital publications have an impact on a scientist’s international reputation but it also raises the issue of quality assurance. Tools provided by the World Wide Web and the Internet enable online publications but do not control their quality. Some scientists critically question the value of citations and Citation Indexes. According to Farmer digital publications make a scientist internationally known no matter what quality the publications are. He hardly checks Citation Indexes and does not really use programs to search for citations because he has never been a believer in counting publications. “I don’t put too much emphasis on it. I know it’s easy to say I have had 300 citations and so my article is more important than another one who had 50 citations. Looking at the one who might have said 50, for example, maybe only 50 people are important. I always look at it like that” (Farmer 2008).
2. Analysis of Interview Data

As far as scientific reputation is concerned Kurt Liebminger refers to a shift from counting publications to looking at citations but he generally considers the Citation Index of low importance for scientific reputation. "Ich würde jeden davor warnen zu glauben, dass er jetzt tatsächlich über die Präsenz eines Wissenschafters bzw. Wissenschafterin im öffentlichen und wissenschaftlichen Diskurs über Google Scholar wirklich was erfahren kann. Das sind höchstens erste Hinweise zumindest in den Wissenschaften in denen ich arbeite und in den Räumen wo ich präsent bin. Natürlich merke ich das dann auch, wenn ich bei Kollegen und Kolleginnen recherchiere, von denen ich auch weiß wo die zitiert werden. Das ist für mich kein wirklich aussagekräftiges Verfahren" (Liebminger 2008).

According to Liebminger the Citation Index is an ineffective tool for measuring a scientist’s reputation. Sometimes he would use Google Scholar when searching for citations but due to his personal experience tools such as Google Scholar present an incomplete picture of a scientist’s work. “Man weiß ja wo man zitiert wird, welche Bücher tatsächlich intensiv rezipiert werden und wo die großen Rezensionen erscheinen. Google Scholar erfasst davon wirklich nur einen Bruchteil” (Liebminger 2008). Moreover, he comments on differences between Human Sciences and Natural Sciences concerning software tools measuring scientific reputation. In this respect, reflecting on Citation Index he mentions that “in den Geisteswissenschaften dieses System noch nicht so elaboriert ist wie in den Naturwissenschaften. Es gibt hier auch keine für alle verbindlichen Indizes. Es gibt da einige konkurrierende sowie andere Indikatoren, die man im Internet recherchieren kann” (Liebminger 2008).

Generally differing degrees of digitization between Natural Sciences and Humanities are impact factors for checking Citation Indexes or using Citation software. The results of my study show that mostly computer scientists demonstrate high degree of checking Citation Indexes such as Google Scholar or CiteSeer and consider citations as measuring tools for scientific publications as well as ranking these. In contrast those fields belonging to the Humanities are lagging behind and thus do not regard Citation software as a highly important factor reflecting on a scientist’s reputation in his/her field.

In this respect we may draw a parallel to Müller-Mandl’s professional experience that a shift from counting publications to looking at citations is already visible, stea-
2. Analysis of Interview Data

daily progressing. Moreover, she expects a total shift from traditional publications to
digital ones in the future. “Im Augenblick gibt es aber noch einen sehr großen Un-
terschied zwischen den Geistes- und Naturwissenschaften,” Müller-Mandl remarks.
In this respect she refers to a colleague in Natural Sciences who considers the web as
a highly important publication tool for his research work. “Er hat einen Gedanken
noch gar nicht fertig gedacht, noch nicht den ersten Buchstaben gesetzt und schon
ist es im Netz. Das ist für ihn ganz wichtig. Das sind die Publikationsorgane, die mit
Punkten versehen sind. Bei uns ist das noch nicht der Fall und wir kommen erst jetzt
in diese Phase” (Müller-Mandl 2008).

Referring to the arguments above and to my other interview pa-
tners I draw the fol-
lowing conclusions. First of all, digital publications increase a scientist’s reputation
on both national and international level. Second, scientific discipline presents a crit-
ical factor dealing with digital publications and [Science Citation Index]. In Natu-
rals Sciences digital publications are far more important than in Humanities where
traditional publications are still predominant. “Wenn ich an die großen Vertreter
bzw. Vertreterinnen des Fachs denke, dann publizieren diese durchwegs nach wie
vor noch auf dem Papier,” comments Müller-Mandl. Since the Humanities are still
traditionally oriented she points out that online publications would have no impact
on her reputation as a scientist. “Der Name ist vielleicht präsenter. Auf die Reputa-
tion gibt es derzeit noch kaum Auswirkungen, denn diese Fächer sind insgesamt
noch sehr traditionalistisch ausgerichtet. Es würde mich aber besonders bei jungen
Kollegen und Kolleginnen bekannter machen” (Müller-Mandl 2008).

Finally I draw the conclusion that digital publications present a PR-tool for scien-
tists in order to gain more publicity. In case of Müller-Mandl her publicity among
younger colleagues would rise due to public access to her research work and her
web presence.

Referring to my interview partners, we may conclude that some scientists regard the
Citation Index as a highly effective tool for presenting a scientist’s reputation while
others critically question its quality. Generally, a shift from counting publications to
counting and looking at citations is visible in all scientific fields but its real mean-
ing for scientific reputation is still unclear and critically questioned especially from
scientists belonging to Humanities. Thus, the scientific field seems to be an impact
2. Analysis of Interview Data

factor on the degree of digitization. Liebminger, for example, does not know exactly whether his web presence and his presence in virtual spaces increase his international scientific reputation. “Das kann ich nicht wirklich abschätzen, weil ich nicht abschätzen kann was diese virtuellen Räume und diese Communities, die sich dort bewegen, tatsächlich bedeuten. Natürlich ist es so, dass man durch diese Präsenz im virtuellen Raum nicht nicht präsent ist” (Liebminger 2008).

Digital publication of the XY-Software guide, for example, and other digital publications have caused an increase of his worldwide reputation Duchamp would assume. “So I would say that my name is known somewhere by some people all over the world because of the web. It would not be doing otherwise, I suppose” (Duchamp 2008). Generally, he does not search for citations of his scientific work and therefore does not use Citation software programs such as [Google Scholar] or [CiteSeer]. One of his colleagues did search the Citation Index to try to measure the impact of their work. Daniel Thunder regards the Citation Index as not very important for scientific reputation. Moreover, he does not care about Citation Indexes, as for him these are ineffective tools for ratings.

Currently, digital publication has no effect for Morrison on his reputation. From his personal point of view the usage of software such as Google Scholar or CiteSeer were not satisfactory for two reasons. First, he works within very narrowed public relations and therefore knows almost everything that is out there. As from his point of view so few good things are out there, he knows that small area without Google. Second, he tends to work very synthetically, using many sources. In case he looks for new ideas he would look for what is happening in science, crime, science fiction or popular business rather than the typical academic sources (Morrison 2008).

Citation Indexes are used as a measuring tool for ranking scientists in several countries such as New Zealand. There, researchers may voluntarily use a citation website for publications and as a measure for quality. Jackson, for example, has used it to her benefit in terms of making sure that she gets ranked as an A grade researcher. “The Citation Indexes have been used in New Zealand in our new system like the Research Assessment Exercise in UK [RAE 2008]. We got a similar thing in New Zealand which is going on now for six years. It only occurs every six years. Academics are supposed to put forward a portfolio in case it is quality” (Jackson 2008). Apart from that she
2. Analysis of Interview Data

does not use any other Citation software. In this respect we may argue that the Citation Index is regarded highly important for scientific reputation as it measures a researcher’s reputation and is used as an effective tool for quality assurance.

Denver occasionally searches for citations using Citation software. “I have done it once or twice. Occasionally. Mainly because every three years we have a research evaluation exercised. So everybody has to go through this and the university has to submit a portfolio and so on. When that comes around, people will typically go on to something like Google Scholar and find out about it” (Denver 2008). Digital publication has probably not directly affected his reputation. But he seems to get quite a few enquiries from people worldwide wanting information such as on a journal publication. According to Denver digital publication increases global contacts for researchers. He refers to one of the main effects from his experience of digital publication is that the amount of people worldwide contacting researchers asking for specific information is rising.

Like most interview partners, Liebminger refers to a rapid growth of establishing contacts and collaborations based on web presence taking the following factors into account: rapid access to scientists’s profiles. “Heute kann ich mich relativ schnell über jemanden informieren, den ich noch gar nicht kenne. Durch diese Möglichkeit steigt auch die Attraktivität, um z.B. Kontakt zu Kollegen und Kolleginnen zu suchen, die man aus anderen Zusammenhängen noch nicht kennt” (Liebminger 2008). Easy and rapid search for people’s technical data such as phone numbers, addresses, email addresses to contact them when organizing meetings or symposia. “Das ist wirklich ein organsiationstechnischer, gewaltiger Sprung, der Arbeit erleichtert.” Establishment and intensification of national and international contacts as well as collaborations with other scientists or scientific communities. “Diese Formen der Kommunikation, des Austausches haben sich durch das Netz wirklich intensiviert und beschleunigt. Kontaktmöglichkeiten, Diskursmöglichkeiten und dergleichen vervielfachen sich blitzartig”, argues Liebminger (2008).

Some of those scientists who do not care about Citation Indexes and checking these for their citations do not regard feedback on their reputation as necessary during the last years. Most of them view Citation Indexes of low importance for a scientist’s reputation. The reason for seeking no more feedback on his reputation is not tech-
2. Analysis of Interview Data

nology based but one of the impacts of the latest developments at university. “Ich schätze die Entwicklung der Universität in den letzten Jahren unabhängig vom Computer und all dieser Technologie nicht. Ich habe eine gewisse Bezugsgruppe, Historiker und Historikerinnen aus der Schweiz, Deutschland und den Niederlanden. Dann gibt es eine nächste Generation, die ich schätze. Darüber hinaus kümmere ich mich um diese Dinge überhaupt nicht mehr” (Friesacher 2009).

As far as publications are concerned he generally experiences a certain PR-Mania in science he considers problematic for it lowers quality of research work and results in mainly using English, the Lingua Franca of the net. Referring to increased usage of English he points out that it is mostly a so-called “Allgemein-Englisch” since it is impossible to obtain a command of a language at the level of native speakers and most scientists are still struggling with doing their research work in English as native speakers of other languages. In his field of science it is rather difficult to publish a good book in English because it is rooted much more in native languages than other fields and a scientist needs a good translator or native speaker. “Junge Kollegen und Kolleginnen bemühen sich natürlich auch in allen möglichen Sprachen besonders in Englisch etwas unterzubringen. Natürlich: Das wiegt viel mehr. Das ist mir aber gleichgültig. Das ist nicht meine Welt. Mich interessiert da viel mehr ein Publikum, ich will zumindest 200 Auflagen, ich will einfach Leser und Leserinnen haben” (Friesacher 2009).

As far as scientific reputation is concerned Lenz reports on more visibility of research work due to digital publications in his field. Additionally, he reports on a shift from traditional journals in German to publications in English. Generally we may argue that international virtual collaborations result in predominance of publications in English. According to Lenz there is not only a visible shift to digital publications in English, but also an increase in his international collaborations. “Mir fällt schwer da zu sagen was ist Internet bedingt und was ist einfach eine Entwicklung mit zunehmender Internationalisierung. Aber ich bin sicher, dass die Internationalisierung und die grenzüberschreitende Kooperation und damit faktisch verstärktes Publizieren in Englisch massiv durch Internetkontakte gefördert wurde. Ich kommuniziere heute mit ausländischen Kollegen und Kolleginnen viel mehr als vor zwanzig Jahren. Das führt dann auch durchaus zu Gemeinschaftsproduktionen, bisher noch im klassischen Printmodus” (Lenz 2007).
Here I draw the conclusion that publications in English have become a fighting tool for gaining reputation in the fields of science on both national and international level. Moreover, publications in other native languages will decrease in importance for research work and its publications, and some will be extinct. In this respect using the web for publications in the Lingua Franca has changed into a fighting tool for a scientist's career, too. Web presentation as many interview partners have already noticed make scientists more publicly known and are the new forms of publication tools used by the younger academia, all digital natives.

2.7.2. Remarks on Language Use and Concluding Thoughts

Net presence, digital publications or rankings of scientists by citations intensify international collaborations and thus contribute to their scientific reputation within their fields. Though some scientists critically question the value and the quality of Citation Indexes and digital publications, these tools provided by the Internet and the World Wide Web have already been implemented as standard tools in the field of science for presenting a scientist's professional profile. In this respect we may conclude that the existing shift from counting publications to counting citations is almost completed and thus Citation Indexes play a highly important role concerning scientific reputation nowadays. For these reasons, citations and digital publications in the Lingua Franca of the net present effective tools for fighting for positions for scientists closely related to the degree of digitization in their fields. Generally, as I have pointed out already in the previous chapters and as I will refer to more explicitly in Chapter 3 there exists a difference in the degree of digitization between Humanities and Natural Sciences.

Since English has developed into the Lingua Franca, scientists are faced with the issue of asymmetric communication. Scientists communicating and collaborating globally are engaged in a process of transferring information, exchanging scientific data or ideas, and sharing thoughts with other scientists of the same field or closely related fields. The Internet and the World Wide Web not only provide a basis for global collaborations and interaction in science but also tremendously accelerate these. In this respect scientists globally communicating and collaborating engage in asymmetric communication.
2. Analysis of Interview Data

What is meant by asymmetric communication and which problems are likely to arise from this asymmetry for scientists? The famous communication theorist Paul Watzlawick (Watzlawick, Beavin, and Jackson 1967) defined five basic axioms in his communication theory that are essential to have a functioning communication between two individuals. One of these axioms dealing with symmetry and asymmetry is defined as follows: Inter-human communication procedures are either symmetric or complementary, depending on whether the relationship of the partners is based on differences or parity. Concerning my interview partners who come from different geographic areas and thus from different language areas, asymmetric communication is a natural part of their communication processes. This fact is not only technology driven but also by speaking different languages as mother tongue. Especially the German-speaking natives among my interview partners need to adapt to collaborations in the English-speaking world.

What does this mean for German-speaking native scientists? Are they disadvantaged in fighting for positions in the field of science? Do they need to fight against predominance by English-speaking native scientists? Which tools the actors in the scientific field use in order to deal with this predominance in form of the Lingua Franca of the net?

Web presence in English has already turned into a PR-tool for scientists to gain international reputation. Additionally, digital publications, talks, and citations have turned into fighting tools for positions in the scientific field. Members of the older academia are less affected actors since they do not need any further career advancement and are already positioned in their field and scientific community respectively. In contrast, members of the younger academia naturally use these fighting tools when seeking career advancement in order to position themselves. I assume that those scientists who do not use these new tools are very likely to be marginalized. Most of the members of the older academia do not care about it for various reasons I have already discussed in the chapter above, but those who implement these tools into their professional activities I assume will experience an increase of reputation worldwide as well as an increase in contacts coming from outside their field they consider important for their scientific work.
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At the end of my interviews I asked each study participant to personally reflect on certain issues he/she considers important and relevant concerning their communication experiences with online tools. So the title of this chapter refers not to my personal evaluation but describes my interview partners’ reflections.

3.1. Immigrants, Natives, Generation Gap, Fighting Tool

The findings of my case studies revealed that the Internet and online tools provided by the World Wide Web have caused major changes for scientists, strongly affected their working conditions, transformed their professional and personal communication patterns to various degrees, resulted in high impacts on both national and international collaborations, and strongly affected forms as well as access of publications in science and research.

Broadly speaking, referring to Prensky (2001) I differentiate between two main groups scientists belong to. The first group consists of traditionally socialized scientists born into the non-digital world, the so-called digital immigrants. The second group is formed of digitally socialized scientists already born into the digital world, the so-called digital natives. Mark Prensky, an international thought leader, speaker, writer, consultant, game designer in education and learning, claims to have coined the term digital natives. He argues that there exists a new breed of students today
3. Personal Evaluation of Internet Communication

and refers to them as digital natives for the following reasons: being surrounded by and using “toys and tools of the digital age” email, Internet and the World Wide Web have become integral parts in their lives. They are “native speakers” of the “digital language” as they were born into this new culture emerging from “digital technology”. For them electronic communication (“digital language” as Prensky calls it) is natural and already implicit as they have “acquired and perfected the new skills” required by technology “for years of interaction and practice”.

In contrast these skills are totally foreign to people who were not born into the digital world and have to learn the digital language step by step to be able to adapt to the environment of the digital era. Prensky refers to those people as digital immigrants, who have become fascinated at some later point in their lives by the new technology and adopted many or most aspects of it (Prensky 2001). Additionally he points out that digital immigrants no matter how fast and well they adopt to their environment would always retain “to some degree their accent” which means “their foot in the past”. There are many examples of the “digital immigrant accent” such as turning to the Internet for searching information second rather than first, printing out emails, physically presenting websites instead of sending URLs and so forth (Prensky 2001).

Referring to the key findings of my interviews, I agree with Prensky’s definitions on digital natives and digital immigrants even though Rolf Schulmeister critically reflected on the existence and strict definition of a net generation after evaluating more than 50 studies carried out on Internet users (Schulmeister 2009). All my interview partners belong to the group of digital immigrants being confronted with transformation processes caused by accelerating development and dissemination of digital technology. For this reason they have been/are constantly involved in the process of “digital language” acquisition passing through several stages from beginner to intermediate and finally advanced level as far as digital technology and operating digital communication tools are concerned. The results of the interviews show that all of them voluntarily and/or involuntarily retain their individual digital immigrant accent to certain degrees. Some interview partners seem to experience feelings of shame and guilt for not being able to get rid of this accent or maybe having not tried hard enough to overcome this problem as we may see following Jackson’s personal history focusing on the World Wide Web and the Internet. Jackson refers to personal limitation and feelings of guilt and shame for lagging behind as she describes
her usage of the Internet as a “slowly progressing” and “still very limited” one starting “just five years ago” (Jackson 2008). Most interviewed scientists blame “lack of time”, “generally rising working load”, and an “extremely high time costs factor” for acquiring an effective and efficient command of digital language to operate with in research and teaching. A few deliberately carry on with their professional activities in the traditional ways keeping “both feet in the past”.

In this respect we can see from the results of my study that implementation of technology in scientific work is closely related with a generation gap, which actually splits scientists into digital immigrants and digital natives. What do I mean by generation gap concerning technology as well as acquisition of its tools? All my interview partners, members of the old academia, are faced with both members of the young academia and a new generation of students, the digital natives, whereas they themselves belong to the group of digital immigrants. Some of my study participants refer to biological age and the resulting generation gap as a critical factor concerning usage of technology. From Dennis Morrison’s point of view, usage of electronic tools is a generation desire, a strong way to communicate for younger academics (Morrison 2008). Thunder, an early adopter of the constantly emerging virtual tools, thinks that the research community he is involved in “is low way behind compared to what the average twenty-year-old is actually doing in social experiences. They spend a lot of time with [Second Life], [Facebook], [Google], and so on. They are already exploring that sort of world. We still are, you know, holding off and doing things in a more traditional way. So there is a gap there as biological age is considered. This presents a critical factor in using electronic tools. The search community needs to see how you can use some of these things to advance their own purposes” (Thunder 2008).

Reflecting on his personal history with the World Wide Web and the Internet the Canadian computer scientist Roland Duchamp refers to the generation gap too as he points out that “especially younger people” demonstrate a strong tendency or have already totally shifted to searching for material by using Google (Duchamp 2008). Concerning participation in videoconferences, Maier argues that even as a computer scientist he would still belong to the group of digital immigrants. When referring to the question of generation gap he draws a parallel to using the phone. “Für mich ist das Telefon noch immer ein Gerät um Sachen zu erledigen, aber nicht ein Gerät um sich zu unterhalten. Ich glaube, das ist eine Generationenfrage. In der Zeit in der
3. Personal Evaluation of Internet Communication

das Telefonieren und transkontinentale Telefonieren sehr teuer war, hat man sich auf das Wichtigste beschränkt. Das was ich jetzt erlebe, dass Leute eine halbe Stunde telefonieren, ist mir fremd. Das ist glaube ich die Generationenfrage, dass man damit aufwächst oder nicht aufwächst. In diesem Sinn bin ich, obwohl ich lange in der Informatik bin, immer noch ein Immigrant" (Maier 2007).

According to Friesacher most of the weaknesses and disadvantages in dealing with electronic tools provided by the Internet and the World Wide Web are related to the older generation and older academia respectively. Since this generation forms the group of digital immigrants who were socialized with books they are faced with major difficulties in shifting from traditional communication tools to virtual ones. The younger generation has already been socialized with technology and therefore deals with it more naturally and effectively. “Viele der Schwächen beziehen sich eher auf die ältere Generation, die Fünfzig- bis Sechzigjährigen. Vielleicht auch noch die Vierzigjährigen. Die ganz junge Generation hat diesbezüglich in der Zwischenzeit einen Umgang wo die Sache wieder in Ordnung geht. Bei den Älteren ist vieles sogar komplizierter geworden” (Friesacher 2009).

Additionally the generation gap is reflected upon as critical impact factor as far as online teaching is concerned. “Wir hätten hier die Möglichkeit. Es wird alles angeboten. Aber interessanterweise machen es hauptsächlich die ungefähr zehn Jahre jüngeren Kollegen und Kolleginnen. Allerdings jammern sie über den Aufwand des Ganzen”, states Müller-Mandl (2008) in this respect. Referring to the results of my study – this has been discussed in detail in Section 2.5 - we can see very clearly that scientists as digital immigrant instructors are not only struggling with “digital technology acquisition” but also regard face-to-face-communication with their students as essential and thus carry on with traditional forms of teaching. Prensky refers to this issue as “digital divide” considering it one of the biggest problems facing education today, arguing that digital immigrant instructors speaking the language of the so-called pre-digital age are struggling to teach a population speaking an “entirely new language” (Prensky, 2001). The analytic analysis of my data demonstrates that scientists as digital immigrants show a strong preference for traditional face-to-face teaching methods not only due to poor command of “digital language” and its labor intensive acquisition but also for regarding physical presence when interacting with students as basic requirement for quality in teaching. Arguments focusing on
3. **Personal Evaluation of Internet Communication**

this partly slowly progressing shift from traditional teaching to online teaching were already dealt with in Section 2.5.

Summing up, I conclude that there exists a generation gap in using electronic tools for researchers as digital immigrants still demonstrate the tendency to follow the traditional way rather than experimenting with and using tools provided by the Internet and the World Wide Web. When reflecting on their personal evaluation on using the World Wide Web and the Internet as a tool for both research and teaching all interview partners commented on a visible shift from “the symbols of the old academy” to get in senior positions they are right in now to “the Internet symbols for the younger academy”. This shift causes curiosity and anxiety among members of the old academy that still show a tendency to expect younger colleagues to use the Internet for scientific purposes rather than themselves. “I think that we have just felt ourselves as a kind of deep loyalty to those symbols of the old academy and those were symbols we needed to use to get to the senior positions we are right in today. Of course we enable to be able to cling onto them. But I do think that we expect our younger colleagues to get into the Internet on ways that we haven’t. We are a little bit anxious and suspicious about it. I think partly it’s just something that’s new and therefore frightening in a sense” (Jackson 2008).

This visible generation gap seems to be another source of feeling guilt and shame namely for “clinging onto a certain kind of identities” and not making or only being partly willing to make the same shift as required from researchers of the younger generation. In this respect Thunder points out that search communities need to experience the benefits derived from these new tools for their research rather than resist these new tools regarding them as a bit frightening (Thunder 2008). On the contrary, Lacroix does not refer to the age factor as playing a critical role in using and experimenting with electronic tools provided by the World Wide Web arguing that it is not the fear of technology researchers his generation resist dealing with, but it is a question of being aware of its limitations concerning research. He does not consider age a critical factor setting limits to using technology. Most of his colleagues his age are proficient in technology. It’s not an issue. They welcomed technology twenty-five years or twenty years ago. But the web has changed. From his point of view the web is no longer material technology. It’s a kind of political technology, a social technology. “And hidden under let’s say standard technological progress,
right, and so the point is that this whole subtext of power which is being ignored
frankly with this love of technology is just there and taking over and changing how
people view the world. It’s not true that the web has actually opened up the world,
it has opened up certain sectors of the world and whole other sectors have dropped
off the map. There exist intellectual and psychological limitations due to the web
for a redefinition of content towards a narrowing of content due to expansion of the
public” (Lacroix 2008).

Speaking in terms of positions in the field of science almost all my interview candi-
dates are university professors positioned on top in the field of science. Some refer
to themselves as being “privileged” for retiring soon and being at the end of the pro-
fessional career (for example Friesacher 2009; Lacroix 2008; Sellers 2008 etc.). They
are in senior positions, have already reached a top position in their field of science
and therefore do not need a further career move entirely based on proficient knowl-
edge of technology or the Internet as a fighting tool for positions in their institutions
anymore. So they may decide on their own how and to what extent they want to
use and adapt to the innovations provided by the new media respectively the World
Wide Web.

In contrast, members of the younger academia, actors already socialized by online
technology, still seeking a career move and reputation in their particular field natu-
really use online communication tools provided by the World Wide Web and the In-
ternet for career building and gaining reputation. On the one hand, as I have already
pointed out above, they are required and expected to use online communication
tools for research and teaching by the older academia. On the other hand, accord-
ing to my interview partners there is a strong tendency in the field of science to shift
from counting publications to counting citations. Web presentations as many inter-
view partners have already noticed make scientists more publicly known and are the
new forms of publication tools used by the younger academia. The importance of
having an Internet profile and the impacts of web presence on a digital immigrant’s
scientist’s reputation has been discussed more explicitly in the chapter on weblogs
and websites.

As far as international collaboration is concerned, the Canadian computer scientist
Daniel Luchard argues that due to the World Wide Web and the Internet collaborat-
ing globally with other scientists is possible now for both the young and the older academia. In the old days it was rather difficult for the young academia to attend international conferences for establishing worldwide collaborations due to costs and the position they had in the field of science. But international collaboration plays a very important role for scientists as it has an impact on their reputation and is also used as a fighting tool within the field of science. In this respect, Luchard points out that the theory goes that not a very important scientist, a small fish, works with local people and that a big fish, a well known scientist, works internationally. But due to the Internet and the World Wide Web this is irrelevant (Luchard 2008). All scientists, regardless of their biological age or their position in the field of science, may establish international collaborations using online tools whereas in the past they had to participate in expensive meetings.

According to the arguments discussed above we see that the World Wide Web and the Internet are already used as fighting tools for positions within the field of science. The age factor closely related to the position in the field of science, which means that scientists have to belong to the old academia, full professors for example, in order to get invitations from all over the world to participate in meetings and conferences has become a less important factor for gaining international reputation. It is the online tools that enable young scientists to establish international contacts without support by the old academia. Moreover, it is the young scientists who accelerate the transformation process for they are the digital natives.

3.2. Fascination, Attraction, Entertainment, Distraction, Threat

How do scientists as digital immigrants react to implementation of online tools provided by the World Wide Web and the Internet in their professional environment? Which problems are they faced with when integrating these tools into their professional activities gradually shifting from traditional to electronic communication tools in research and teaching? How do they view online tools and the impacts on professional and personal communication activities?
Describing the shift from traditional tools to online tools we can differ from various reactions. The new technology is frightening, attracting, fascinating, enticing, distracting. They are anxious, suspicious about online tools and their effective usage for professional activities. On the contrary they feel fascinated by, attracted to and curious about using and experimenting with these new tools. Most scientists experience a high degree of distraction caused by the Internet and the World Wide Web, especially dealing with email communication and using the Internet for data research. They report on difficulties to continuously engage in scientific work for the Internet, for example, causes too many distractions; pleasurable ones as well as unpleasant ones.

“There is pleasure in just being available and being distracted”, argues Alberta Jackson, who describes herself as the sort of person who is too easily distracted, loves writing and in case someone pops up and says something to her she is glad that someone calls her attention. Composing, exchanging emails is experienced as entertainment, there are fun exchanges with colleagues and friends, it is a pleasure in being available and conducting enjoyable chats with people worldwide (Jackson 2008). Some scientists like Winter (2008) tend to have a lot of fun composing emails. In this respect, it becomes clear that dealing with or managing emails is linked with an entertainment factor as well. It is not just filing, piling, delegating, time consuming, or even pure stress. It can also be “fun” (Winter), “pleasurable distraction” (Jackson), “man möchte ja auch wissen, was denn gerade da draußen los ist in der Welt. Das macht Spass” (Maier). It obviously causes fun and pleasure to overcome geographical borders without leaving the office or home and experiment with these new electronic communication tools.

In contrast, electronic communication tools present a source for negative distractions and strong impediment when seriously working on a piece of scientific work. Steadily incoming mails, for example, cause a distraction in the workflow. In this respect, Maier refers to two types of distractions, pleasurable and impeding ones. “Es gibt schon Situationen, wo man das Gefühl hat, dass Mails eher störend sind. Im Großen und Ganzen ist bei mir dieses Gefühl aber nicht so ausgeprägt, sondern überwiegt eher das Gefühl einer netten Unterbrechung” (Maier 2007). In case he really wants to work without distractions he would turn off the Internet and entirely go offline. Kurt Liebminger refers to offline periods as highly critical factors for con-

At this stage it becomes clear that scientists must engage in offline periods in order to be productive regarding research and scientific work. Thus we may generalize that electronic communication tools provided by the Internet and the World Wide Web not only facilitate scientific work but also strongly impede scientists working in one piece due to various sources of distractions such as incoming mails or frequently checking mailbox and usage of mail reporting system. Liebminger, like Lenz and other interview candidates, would turn off mail reporting system when focusing on research work. “Im Prinzip habe ich so ein Meldesystem. Wenn ich dann konzentriert arbeite, schalte ich es entweder aus oder ignoriere es. Ich reagiere dann nicht mehr darauf” (Liebminger 2008). Others are still struggling to develop certain techniques and strategies to fight these interruptions or “pleasurable distraction in being available” in order to get their work done. For some, going off-line is simply a new practice in dealing with technology tools for the degree of fascination and attraction is still very intense.

Concerning fears or threat caused by new and innovative technology tools used in research are derived from various sources. Some relate to feelings of dangers, insecurity, and pressure when being confronted with entirely new forms and tools for doing research as researchers used to do for ages, especially researchers belonging to the old academy. Moreover, increasing and intensifying lack of technical knowledge in operating electronic communication tools result in feelings of fear and torments for scientists who resist the shift from traditional communication tools to electronic ones. “Ich kann mit dem so schlecht umgehen, dass alles nur eine Quälerei wäre. Das hat sich natürlich auch verfestigt und ab einem gewissen Zeitpunkt ist man dann diesbezüglich so ein Neandertaler, dass es tatsächlich ein wenig Angst vor dem ganzen Bereich gibt” (Friesacher 2009). Another one is caused by the fears that “some-
one else could see the results before I do” (Thunder 2008), the fears that are likely to rise when trying to shift from an individual culture “mine alone” in the “ivory tower” in research to the open access culture of collaboration and sharing material. From Thunder’s point of view the shift to a culture of collaboration has benefits and advantages for there are “strengths in sharing material, talking about it, viewing it, thinking, and reflecting about it” (Thunder 2008).

Operating technology is still a source of difficulties and dangers. On the one hand technology has created lots of wonderful opportunities for researchers, but on the other hand it can be very frustrating in case it does not work. He had this sort of experience when you open something up, and it suddenly disappears or there is some problem with the program. “That can be quite frustrating”, Denver (2008) says. In fact, electronic technology needs basic knowledge for operating and using it for research work. Otherwise, it leads to time constraint, frustration and therefore negatively impacts the workflow.

Summing up, I conclude that on the one hand, scientists as digital immigrants feel threatened (problem of quality assurance, changing working conditions resulting in overload, time pressure, group pressure, lack of technical knowledge, total dependency on technical tools, distraction, email floods, floods of information, information overkill – these are discussed in Chapter 2) by the tools provided by the Internet and the World Wide Web but on the other hand they seem to be fascinated by the fact that, despite technical obstacles, scientists may engage in innovative forms of successful and effective cooperations both on national and international level. “Aber trotz dieser technischen Hürden ist es möglich gewesen hier etwas Neues zu machen,” argues Lenz (2007) in this respect.

Additionally, my study shows that it is obvious that online tools provided by the Internet and the World Wide Web are not just always used for pure scientific purposes, but also out of fascination, curiosity and pleasure in contacting, corresponding, interacting. It is not always clearly pointed out in the interviews what scientific purposes email correspondence and other tools provided by the World Wide Web are used for. It appears that sometimes dealing with electronic tools provides an opportunity for scientists to engage in pleasurable and creative activities.
3.3. Increasing Workload, Group Pressure, Lacking Strategies, Transitional Stages

A further conclusion I draw from the analysis from the interviews I conducted with scientists as university professors is that almost all of them are still struggling with the problems as well as the obstacles of transitional phases shifting from traditional tools in science to electronic ones. These difficulties are not technology driven but result from the actors dealing with it. They still lack strategies in effectively operating technological tools due to various reasons such as time pressure, group pressure, lack of technology skills, increasing workload, fascination of opportunities provided by these constantly and rapidly emerging tools or simply out of total or partial resistance in dealing with them. Paul Friesacher points out that, from his personal point of view, digital immigrants are faced with difficulties in handling online tools as well as change of increasing workload due to lack of effective strategies in using and operating these tools. “Es liegt keinesfalls an der Technologie, sondern einfach daran wie die Menschen damit umgehen”, argues Friesacher (2009). He reflects upon the difficulties such as time costs, increase of workload, rising paper consumption etc. caused by the new media and its implementation as typical problems of a transition period. “Das sind typische Übergangsschwierigkeiten, die vielleicht fünf oder zehn Jahre dauern.” According to Friesacher the virtual world although not his preferred one will turn into a reasonable one as soon as all these transitional periods are successfully finished.

This is agreed on by Pongratz referring to implementation of electronic technology causing major changes in working conditions for scientists, because it not only affects research and teaching but also core areas such as the entire university administration. From her professional and personal experience, scientists still lack strategies in properly dealing with electronic tools and proper goals for usage. “Es verändert unser Modell von Forschen und Lehren. Es geht bis in die Kernbereiche und betrifft somit auch die gesamte Verwaltung. In den sehr kommunikativen Wissenschaften kommt es ja unmittelbar an den Kern heran. Ich bin Sozialwissenschaftlerin, das mag in technischen Wissenschaften anders sein. Ich glaube, dass wir alle noch nicht die Tragweite realisiert haben. Die Reflexion und der ganz bewusste Umgang mit di-
gitalen Technologien hinkt noch etwas nach. Man wird so überrollt von dieser neuen Technologie und man nutzt das und in der Begeisterung nutzt man alles” (Pongratz 2007).

In this respect, I conclude that scientists are still lacking both strategies and resulting reflections from these in effectively dealing with electronic communication tools, because most of them, especially digital immigrants, still do not know how to use and benefit from the advantages provided by these tools and how to reduce disadvantages or impediments as far as their research and work as a scientist are concerned. It still remains unclear which scientific goals are met by which tools, whether they are used for personal, professional or scientific motives. “Irgendwann muss man sich als Wissenschaftler bzw. Wissenschaftlerin auch fragen wie und was davon will ich ganz bewusst einsetzen. Wo darf ich mich nicht verführen lassen, was muss ich wieder zurück drängen”, Pongratz critically reflects in her personal evaluation on dealing with electronic communication tools provided by the World Wide Web and the Internet (Pongratz 2007).

The Internet has become a basic requirement, a facilitator as well as an accelerator for a scientist’s work because it enables quick and efficient working processes without limitations on time and space. Reflecting on his personal history with the World Wide Web and the Internet, Simon Lenz refers to his stay in Australia when making his first approach to the Internet ten years ago. “Gemeinsam mit einem Kollegen, der hier in O. saß, haben wir den ersten Artikel ausschließlich über das Netz d.h. E-Mail geschrieben. So ist ein Artikel entstanden auf den ich noch heute stolz bin.” At the beginning he was very skeptical about an effective and efficient electronic cooperation due to the following reasons: first of all, he regarded himself a pure digital immigrant concerning his knowledge on electronic technology. “Ich war ein ziemlicher Analphabet was den Umgang mit der EDV-Technik, Mails und Internet anbelangt hat.” Second, he critically questioned quality of long distance collaboration without face-to-face meetings. Third, and closely related to the second argument he was convinced that communication among scientists had to take place face-to-face (Lenz 2007).

Moreover, he was fascinated by the possibility to engage in scientific cooperation at distance with a scientist he already knew. That time he critically questioned the pos-
sibility of effective as well as efficient scientific cooperation such as writing an article from scratch with other scientists one never had personal contact with. “Jetzt haben wir allerdings eine Voraussetzung gehabt, wir haben uns vorher schon gekannt. Ich weiß nicht, ob so etwas funktionieren kann, wenn du jemanden im Vorfeld überhaupt nicht kennst. Aber das war im Prinzip ein Artikel, da stand nicht von Anfang an das Ende fest, sondern das war wirklich sozusagen eine Art “emerging article” (Lenz 2007). In this respect it becomes clear that scientists belonging to the group of digital immigrants critically view electronic collaborations concerning quality criteria due to lack of face-to-face meetings or lagging behind with their electronic expertise and need external impulses to start dealing with technology. A sabbatical leave, a friend or colleagues for example, may function as motivational factors to engage in email communication to continue or engage in collaborative work such as writing articles or even books with co-authors entirely via email correspondence.

In the meantime, he has totally shifted to email communication and intense usage of the Internet. Now as a scientist and in his current position as dean he may do his work at home and does not need to go to his office for he may use a variety of electronic communication or collaboration tools provided by the Internet and the World Wide Web. “In der Zwischenzeit ist es so, dass ich unheimlich intensiv das Medium Internet nutze. In erster Linie für meine administrativen Aufgaben, d.h. in meiner gegenwärtigen Funktion als Dekan hat sich meine Arbeitsweise insofern verändert, dass ich zwar relativ viel zu hause bin, aber relativ ganz viel am Computer sitze. D.h. die Arbeitszeiten sind andere geworden als früher. Die Zeitstrukturen verschieben sich. Selten, dass ich vor neun, halb zehn aufhöre, aber ich bin mehr in meiner persönlichen Umgebung, ich muss nicht hier im Büro sitzen oder in meiner Zelle als Dekan” (Lenz 2007).

This leads us to the question where to exactly draw the line between working hours and non-working hours of a scientist since “digital language” acquisition as well as dealing with online communication tools effectively is very time consuming and thus produces a great potential of time pressure. Drawing these lines has become more difficult for various reasons such as dependency on technology, increasing workload, time pressure and speed in which electronic interactions are expected to be carried out. In this respect Lenz comments: “Einerseits beherrscht man das Instrument viel besser und andererseits beherrscht einen das Instrument viel nach-
haltiger. Die digitale Technologie verändert nicht nur die Arbeitszeit, sondern auch die Arbeitsstruktur in einer ganz massiven Art und Weise. Natürlich liegt das auch viel an mir, dass man sich selber zum Sklaven von so einem Gerät macht” (Lenz 2007). In this respect we can see very clearly that scientists shifting from traditional communication tools to electronic ones in their professional activities demonstrate the habitus of technology driven actors rather than that of efficient, reflective and digitally implicitly structured users or implementers.

Group pressure is another impact factor caused by implementation of technology in the field of science. Daniel Thunder, who started using the Internet among the early adopters at his campus, claims that the World Wide Web and the Internet put a lot of pressure on researchers to go online. An American friend of his, for example, mentioned that he would have no credibility with his students if he did not engage in tools provided by the World Wide Web. This is agreed on by other scientists such as Dennis Morrison, who refers to loss of credibility researchers not using electronic tools are faced with from their students, too. Morrison in this respect refers to cultural differences in experiencing electronic networking. From his point of view there are cultural differences. “I think the American experience is different. I suspect also in Europe. You got to remember New Zealand’s four million people. So there is not the same desire of interactions” (Morrison 2008). According to my study results, cultural differences are no impact factors as far as usage and implementation of online tools in the field of science are concerned. My previous assumption that there are cultural differences in acquiring and operating these tools turned out to be wrong. Scientists of the geographical areas I focused my research on – Austria, Quebec, New Zealand - hardly reported on experiencing cultural differences. For this reason the qualitative analysis of my study did not show differences that are scientifically relevant for my research.

Nowadays, a scientist’s work is reorganized around powerful machines constantly updated as referred to by Thunder. Within this process of reorganizing research work scientists are required to use online tools for both teaching and research. Apart from email communication, already a basic communication tool today, they are “normatively expected” to use tools such as [PowerPoint], [Blackboard], [WebCT] and [Moodle], create a site for each course to provide material or chat rooms for students. Some researchers resist “these requirements” for using electronic tools while others
are bad at refusing it. Additionally, pressure from students, the digital natives, to the teaching environment forces them to integrate those tools in their own courses (Thunder 2008).

Focusing on these arguments mentioned above I conclude that the Internet and the World Wide Web present a new as well as revolutionary dimension concerning working conditions of the average researcher these days. Researchers today are supposed to manage all on their own. In the past they used to have people who would type papers, draft letters, for example. Today as pointed out by Thunder it is a relatively small piece of equipment on their desks and they use it in different extents (Thunder 2008). One the one hand due to the fact that electronic technology tools have been gradually substituting assistants, secretaries researchers are faced with increasing management activities on various tasks delegated in the past. On the other hand pressure from other scientists, the group of advanced technology users, publishers is constantly rising. Therefore there is almost no way left to escape and totally resist group pressure in the field of science as far as usage of the new media or electronic communication tools is concerned.

Accordingly, electronic publications have already become an impact factor on reputation in science. From Luchard’s point of view authors have to publish their work more easily accessible. Those scientists who do not care about electronic publishing are very likely to give the impression that they do not care whether their papers get read or not. They only want to add a line to their CV or say I have published at the conference for the conference is the only thing they want to sell their proceedings on (Luchard 2008). Electronic publications are necessary as more people get access to a scientist’s work and therefore result in rising reputation within the field of science. People who came into the system in the last ten or even five years are faced with citations as measuring tools concerning reputation in research. Lacroix argues that they have to be entrepreneurs of their images that include a lot of Web and online activity. “A lot more than people of my generation do or even would have done perhaps because like I said that the definition of what is considered research has changed” (Lacroix 2008). In this respect I conclude that the shift from traditional publication tools to electronic ones has already taken place and thus put pressure on those scientists who totally/partly resist electronic publication tools.
3. Personal Evaluation of Internet Communication

Paul Friesacher, for example, reports that his system of resisting the shift from traditional communication tools to online ones has started to break down within the last two years. Friesacher is totally aware of his role as an outsider, a dinosaur belonging to a species that will be distinct soon. Additionally, he refers to his privileged situation for retiring soon and being at the end of his professional career. “Ich glaube, dass das eigentlich nur mehr die Aussagen von jemanden sind, der sich da querlegt. Diese Sache ist eigentlich schon gelaufen und ich würde am eigenen Institut wahrscheinlich größte Probleme haben, wäre ich noch eine Zeit länger da. In den letzten zwei, drei Jahren haben die anderen einfach akzeptiert, so auf die Art, der hat halt seinen Vogel, und irgendwie werden wir es mit dem zwei oder drei Jahre lang auch noch aushalten”, he comments.

Indeed as far as professional activities are concerned resisting technology tools is only partly possible because these tools already play an important and dominant role at universities. “Was natürlich auf die Dauer nicht ganz gelungen ist. Ich musste einige Dinge an der Hochschule über dieses Medium erledigen oder auch notfalls erledigen lassen” (Friesacher 2009). Due to constantly and rapidly emerging forms of online communication and collaboration tools group pressure is steadily rising for those who prefer to engage in total resistance. Scientists as digital immigrants may still partly resist in operating these tools but finally they have to accept and deal with these tools in order to actively participate and stay an actor within the field of science. In this respect, John Sellers argues that he as a scientist has to deal with it as there is no choice for being part of an institution. “Ich lebe in einer Institution und ich muss damit umgehen. Ich habe keine Wahl” (Sellers 2008).

Finally, we may conclude that scientists of the older generation still lack effective strategies in dealing with online communication, especially email correspondence that has turned into the basic professional and personal communication tool worldwide. They are still technology driven, but have not yet fully realized and experienced the possibilities as well as their impacts on changing working conditions for scientists. They have either already started using electronic technology tools intensively without reflecting on the reasons and importance for usage or they are still struggling to enter, live, and work in this virtual world. Those who have successfully been trying to resist the shift from traditional to electronic communication tools, to escape growing group pressure from colleagues and students will die out within the
3. Personal Evaluation of Internet Communication

very near future. Friesacher mentions that at work he would not be able to refuse integration of online tools any longer. Finally he has to partly give in due to family reasons and friends who require him to adapt more to the tools provided by the World Wide Web and the Internet. He could escape pressure in professional life but in private life the pressure seems to be growing for him.

In this respect we may conclude that the reasons for using or not using tools of the World Wide Web or the Internet are not always a result of scientific considerations of scientists but obviously result from certain “group pressures” for actors within the field of science. Additionally, it still remains open with most scientists I conducted the interview with which benefits are derived by engaging and participating in online communication. In most cases, the motives for using electronic tools are still not reflected upon and there is a lack of clear reasons for usage of certain communication tools, for example. A further conclusion of the arguments discussed above is that the usage of the media obviously happens without reflection and therefore present notorious actions like drivers used to driving for ages and do not reflect on their activities anymore as beginners would do.

3.4. Facilitation, Acceleration, Dependency, Time Pressure

Tools provided by the World Wide Web and the Internet impact a scientist’s professional life both positively and negatively. All interview partners experience facilitation and acceleration of communication, worldwide collaborations as well as rapid public access to data and a great deal of facts as major benefits derived from these tools. In contrast they are still struggling with the side-effects and negative impacts on their professional activities caused by operating and implementing those into their professional activities as scientists and researchers. Annette Pongratz argues that electronic communication tools on the one hand facilitate establishing contacts and international collaborations due to fast and public accessibility but on the other hand using these technical devices results in total dependency and time pressure. Reflecting upon disadvantages such as time pressure and dependency, she
points out that the number of communication channels has been increased due to electronic technology. “Ein neuer Kommunikationskanal ist dazugeschaltet worden, aber es sind ja die anderen Kanäle nicht wirklich weniger geworden. Man lässt sich auch von dieser neuen Technologie gefangen nehmen. Es ist einfach verführerisch schnell zu reagieren. Es nimmt dadurch natürlich auch einen Großteil der zur Verfügung stehenden Zeit in Anspruch” (Pongratz 2007).

Highly advanced technology for developing hardware shifting from big and heavy mainframe computers to laptops, powerbooks or mobiles facilitates both usage of electronic tools and public access to data for research and worldwide collaborations. In the old days due to the fact that technology was slow and restricted to email communication, collaboration was basically carried out via emails. Jeff Farmer, experiencing the Internet and the World Wide Web revolutionizing his work as a scientist, reports that in the early 90s when on several committees and grant selection committees in Canada he started to really use the Internet to organize symposia for grant committees via email communication and the Internet for establishing contacts with speakers coming from different places in Europe, the States and Canada. Moreover, they would exchange abstracts, presentations and publications via emails. Every new directive from the government organization had to be received by fax or emails.

Today, public access to data and information is provided on websites and other electronic communication tools without any restrictions on space and time. Scientists have not only shifted to accessing data online but also to national and international collaborations using direct access for providing and exchanging material online. “I guess it’s by the World Wide Web, but you actually don’t print anything anymore. Everything I do is by computer. I think some of that is not only because of changes in computers but it also is because of the World Wide Web that enables direct access with our collaborators throughout the world”, argues Farmer (2008) in this respect. Facilitation of communication, setting up global networks, search engines such as [Google] or the development of digital libraries as major benefits derived from digital communication tools is referred to by Sellers. Moreover, he considers the shift from traditional student-professor-interaction to online forms when dealing with student matters as another positive change. One of the main reasons is that he may
3. Personal Evaluation of Internet Communication

Email communication especially seems to have a high potential for controlling and impacting scientists' communication patterns. On the one hand, email correspondence enables fast asynchronous interactions and collaborations worldwide but on the other hand, its intensive usage results in increasing workload as well as time pressure. Most interview partners refer to time as a highly critical impact factor especially when dealing with email management (see Section 2.1). “Hat man früher in der gleichen Zeit noch Zeitporen gehabt, füllt man heute diese Zeitporen dadurch aus, dass man sagt, jetzt noch die nächsten drei Mails erledigen. Dies ist zwar der Maschine eingeschrieben, aber es ist noch immer eine Frage wie man persönlich damit umgeht” (Lenz 2007). Lenz considers himself a “berüchtigt schneller Antworttyp” and therefore personally contributes to a speeding up process caused by both man and machine dealing with technology. A high degree of impatience is referred to as another impact factor concerning email correspondence. “Das ist diese Dominanz der E-Mail, die auch zu einer unglaublichen Ungeduld geführt hat. Das geht soweit, dass mir jemand eine Mail schreibt während ich gerade in einer Sitzung bin. Eineinhalb Stunden später, wenn ich aus der Sitzung komme ist bereits eine zweite Mail von dieser Person da mit der Frage was los sei und wieso ich denn nicht antworte” (Maier 2007).

Due to facilitation and acceleration of communication, interaction, collaboration processes and ease of access, scientists are frequently faced with time pressure. As already pointed out above, email communication has resulted in experiences of time pressure to a great extent. Other contributing factors are acquisition of technical language, lack of strategies and reflections on how to deal with electronic tools effectively, floods of information as well as steadily rapid development of new innovative online tools. In this respect, I conclude that there is a vicious circle concerning the time budget of scientists. On the one hand they are fascinated by the possibility of instantaneous reactions, interactions and collaborations, but on the other hand they feel pressured due to expected instantaneous reactions from people they are interacting with. Again, these are difficulties resulting from transitional stages and lack of strategies dealing with these.
Development of technical slaves and strong dependency on technology presents one more important impact factor on a scientist’s professional life. According to Maier, email playing such a dominant role concerning communication and collaboration has influenced scientists’ behavior and communication patterns in certain ways. One of the main reasons is that it resulted in strong dependency on technical resources and permanent access. “Ich glaube, dass es viele Leute gibt vor allem die, die technisch hoch gerüstet sind, die sich tatsächlich völlig abgeschnitten von der Welt fühlen, wenn einmal das Netzwerk nicht geht oder wenn sie keinen Netzwerkanschluss haben. Man bemerkt das auch bei uns sehr stark. Wenn zum Beispiel einmal der Strom für drei Stunden abgeschaltet wird, wissen die meisten Mitarbeiter und Mitarbeiterinnen nicht mehr was sie tun müssen oder was sie tun sollen” (Maier 2007). In this respect it becomes obvious that people depending on the Internet and the World Wide Web, especially those belonging to the group of digital natives, rapidly shift to isolation experiencing unemployment without online access.

Summing up, my study results show that the computer has become a scientist’s permanent partner for spending most of their time in front of the computer. Maier, for example, argues that they basically spend the entire day in front of the computer not always interacting with it, but as soon as mails come in they will be dealt with, texts are composed and processed, or searching for data and information. Moreover, scientists have developed this attitude of instantaneously expected responses themselves or are still struggling to fight time pressure caused by it. Most of them regard acceleration and facilitation as major positive impact factors resulting from electronic technology. At the same time they are aware of their personal contributions to technology dependency that is produced by both factors man and machine.

3.5. Information Overkill, Quality Assurance, Rising Plagiarism

Most scientists report that they get “flooded”, “swamped” by information due to the World Wide Web and the Internet. Some refer to it as information overkill. Too much information of different quality degrees floods mailboxes. There is a great variety of
low quality products of knowledge provided by tools of the Internet and the World Wide Web. Some feel the pressure of permanently checking new developments in scientific areas. In this respect, duration of knowledge and information is another critical factor that is experienced as fascinating and frightening. “Das Ganze ist beängstigend kurzlebig,” argues Müller-Mandl. “Wenn ich mich darauf einlasse, muss ich ständig kontrollieren ob das der letzte Stand ist oder ob es schon wieder etwas Neues gibt. Das ist eine Faszination aber gleichzeitig wieder eine Falle, weil es mich bindet” (Müller-Mandl 2008).

Scientists today are faced with floods of information from various electronic sources and its accompanying difficulties in properly managing those. Concerning these changes caused by the World Wide Web and the Internet, Maier refers to major challenges for knowledge management and information technology in order to develop new methods for managing a steadily rising quantity of information. From his perspective, new methods are needed to reduce the quantity of information to smaller units that could be called knowledge rather than information. “Das ist glaube ich eine der großen Herausforderungen dieses Jahrhunderts an das Wissensmanagement und die Informationstechnologie, dass wir Methoden brauchen, um die Informationen wieder zu reduzieren, vielleicht zusammenzuziehen zu etwas, das man dann nicht mehr Information, sondern Wissen nennen könnte” (Maier 2007).

Public access to data changes research in various ways. Lacroix argues that on the one hand the Internet and the World Wide Web obviously give you access to a great deal of facts but on the other hand he has noticed that people are overwhelmed by the facts. There are a lot of opinions and a lot of recycling of other people’s opinions as “people make comments on people’s comments and other people’s evaluations and often have difficulties in separating one from the other” (Lacroix 2008). Moreover, he notices a “huge increase in quantity” but at the same time “a huge decrease in quality” as far as research is concerned.

A further reason taken into account for decreasing quality in research is that there has been a shift from private to public space caused by the Internet and its tools for communication. In former days, for example, authors could target their audience directly whereas today they do not know their audience anymore. According to Lacroix, writing on the web means that authors are no longer writing for one person
using communication tools provided by the web and therefore cannot be targeted a particular public whether it is a conference or lesson at university. From his point of view there has been a shift to a completely different style of both writing and presentation. Public access has transformed personal identity to public identity, public personae. One of his conclusions about the presence of the web is that it has created a kind of public domain, very one-dimensional in some ways and thus has affected “how people speak, how people seem to think and how they present themselves in and even off the Internet” (Lacroix 2008).

Following Lacroix’s arguments it becomes clear that both Internet and World Wide Web not only redefine research but also lower quality as well as hinder research work because in his experience the “intellectual work” is somewhat “behind the scene.” In contrast, Luchard considers web presence and using electronic collaborative tools highly effective for doing research especially micro collaboration, micro research. Both scientists critically reflect on the usage of the web for research but from totally opposing positions and points of view. First of all Luchard holds a position as a tenured professor in the field of science whereas Lacroix is a full professor who does not seek a career anymore for being close to retirement. Therefore he does not engage in using the Internet and the World Wide Web as a fighting tool for position. Lacroix apart from email communication and maintaining a personal website resists intense usage and operation of these tools whereas Luchard is the enthusiast as far as electronic technology is concerned.

Concerning quality assurance in research and science Paul Friesacher points out that acceleration in science caused by implementing new media, electronic technology may negatively impact quality in scientific working. From his point of view and experiences, science and acceleration are not compatible and for this reason reintroduction of slowness is required. “Keine Disziplin ist irgendwie wichtig durch Geschwindigkeit. Ich würde sogar behaupten alle unsere Disziplinen leben von der Langsamkeit. Das schnelle Reagieren hat noch nie zu einem guten Wissenschaftsprodukt geführt” (Friesacher 2009). But he is convinced that certain issues will be reintroduced by the next generation. “Eine neue Generation wird das wieder abstellen. Da bin ich mir ganz sicher”, argues Friesacher.
Accordingly, most scientists argue that there are critical issues in dealing with students when communicating and cooperating via Internet and the World Wide Web. Sellers refers to experiencing difficulties dealing with students’ quality of online texts because most undergraduates have not learned to properly deal with the web. Concerning Netiquette in email communication, for example, they are sloppy and especially at the graduate level it is very difficult to get the students acquainted with a notion of authenticity. In this respect he argues that he regards Wikipedia, for example, with ambivalent feelings concerning quality and authenticity of content. For this reason he would constantly advise his students to double and triple check when referring and linking to data provided by Wikipedia (Sellers 2008).

Quality and authenticity of students’ papers is reflected upon as a highly critical impact factor concerning using and integrating tools provided by the World Wide Web and the Internet. Most scientists point out two major critical issues: Lack of Netiquette when dealing with electronic communication, and plagiarism. Detecting and fighting plagiarism presents major problems for scientists at university. Rising quantity of plagiarism, for example, is a critical factor reflected upon by Liebminger. In this respect he refers to decreasing quality of students’ papers and works. He notices that “Seminararbeiten, Proseminararbeiten, Hausarbeiten zunehmend nicht mehr durchartikuliert sind, sondern nur noch sozusagen Blöcke aus dem Internet gezogen werden, irgendwie zusammengesetzt und in eine Ordnung gebracht werden” (Liebminger 2008).

One of the major disadvantages of the Internet is that it has tremendously facilitated and increased the degree of engaging in various forms of plagiarism and has therefore negatively impacted quality in research. Due to the steadily rising quantity of content as well as fast public access provided by the tools of the Internet and the World Wide Web, copying and pasting parts or even the entire work has become very simplified. Liebminger describes this negative aspect of online tools as follows: “Die Kehrseite dieser Entwicklung ist, dass gerade im Bereich der Wissenschaften die Möglichkeiten, die das Internet bietet zu einer Flut von zweifelhaften wissenschaftlichen Praktiken geführt hat. Wir haben einfach die größten Probleme wie wir mit den Internetplagiaten fertig werden. Es ist so einfach geworden Arbeiten zu kompilieren oder überhaupt zur Gänze aus dem Internet zu kopieren und als eigene Arbeit auszugeben” (Liebminger 2008).
Like all interview partners, Liebminger argues that electronic communication technologies may negatively impact quality assurance for reducing the ability to critically reflect on scientific issues, facilitating plagiarism and violating copyright issues. Using and operating electronic technology has negatively impacted scientific arguing, properly dealing with other people’s work and authenticity. Scientists are faced with major difficulties in making their students understand the meaning and the importance of quoting sources. Digital natives show a strong tendency to shift from integrating quotations into their argumentations to copying quotations by simply posting sources without critical reflections. “Wir verlernen bis zu einem gewissen Grad was es tatsächlich heißt in Gedanken zu argumentieren, Gedanken durchzuziehen, Argumente abzuwägen. Wir verlieren das Gefühl dafür wie man mit Texten anderer Autoren und Autorinnen umgeht. Es ist wahnsinnig schwer Studierenden begreiflich zu machen was es heißt jemanden zu zitieren. D.h. nicht ihn bzw. sie zu kopieren, sondern das Zitat muss im eigenen Denkkontext eine bestimmte argumentative Funktion haben. Heute denkt man umgekehrt. Ich habe etwas gefunden, ich stelle etwas rein und damit ist die Sache erledigt” (Liebminger 2008).

In this respect he adds that scientists themselves are exposed to the temptation of using and combining material from the net by orienting themselves by famous key words without critically reading and reflecting those online texts. “Man ist ja selber nicht ganz frei von dieser Versuchung. Man findet sehr viele Materialien im Netz, kann diese rauskopieren und liest sie selber gar nicht mehr richtig. Man orientiert sich an den berühmt berüchtigten Keywords und hält das dann für eine argumentierte Sache. Das ist es aber nicht” (Liebminger 2008).

What are the reasons for students to engage and contribute to this steadily rising plagiarism professors are faced with at university? Which factors make them produce low quality papers? What strategies have been implemented so far to fight plagiarism at universities?

One of the main reasons for students engaging in plagiarism, Müller-Mandl reflects, is that the younger generation, the digital natives, has already adopted a new habitus when dealing with scientific sources and scientific property. They copy and paste not because they are less educated or demonstrate incorrect scientific manners on purpose. As digital natives it is their implicit knowledge they are acting with, it is
a natural part of their habitus. “Ich glaube nicht, weil sie irgendwo schlechter wären, sondern weil sie von klein auf gewöhnt sind mit diesem Wissensfluss zu agieren. Das ist so Teil ihres Habitus. Sie kommen gar nicht auf die Idee, dass sie damit sozusagen fremdes Eigentum verwenden. Wir haben ganz große Probleme damit, dass die Studierenden anerkennen welche Rechte das sind und wie sie das deklarieren” (Müller-Mandl 2008).

Other scientists report on a close relation between decreasing quality of language use and decreasing quality of students’ papers and works. Like most interview candidates, Lenz argues that electronic communication technology may negatively impact quality assurance in science for reducing critical reflections on scientific issues and facilitating plagiarism. Due to slowly but steadily changing working conditions caused by technology, decreasing quality of language use in science is very likely to develop. Intensive usage of the new media, especially during transitional phases for digital immigrants, results in time pressure as well as less opportunities for reflections that are necessary for critical scientific argumentation. “Aufgrund der schleichenden Veränderungen von Arbeit, glaube ich, dass sich die kommunikativen Verhaltensweisen von Wissenschafter und Wissenschafterinnen verändern. E-Mail Korrespondenz z.B. verändert Kommunikationsstile und es besteht die Gefahr einer Verarmung der Sprache durch die starke Nutzung dieses Mediums. Nicht das Medium ist das Problem, sondern die Art und Weise wie wir damit umgehen” (Lenz 2007).

Moreover, he considers this rising degree of plagiarism and low quality scientific discourse at universities a result from both students using and searching Wikipedia as single source for scientific data. Further factors taken into account are the tendency to mainly use PowerPoint slide shows in teaching a tremendously growing number of students at university as well as multiple-choice testing. “Wikipedia ist ein Risikofaktor für die Zunahme der Verflachung des Denkens und Argumentierens. Zusätzlich stellt die Tendenz der PowerPointisierung und der Multiple-Choice-Klausuren die Qualität von Lehre in Frage. Wissenschafter bzw. Wissenschafterinnen verlangen von ihren Studierenden heute viel weniger als früher. Die Studenten und Studentinnen selbst sind aber nicht dümmer geworden. Hier muss ein Gegengewicht gesetzt werden” (Lenz 2007).
Scientists consider using Wikipedia as the only source for searching for material without properly checking on content and sources as a critical impact factor on decreasing quality of students’ scientific work. In this respect Maier criticizes that Wikipedia is still lacking a reasonable balance of integrating both experts and the public. From his point of view, Wikipedia is still predominated by amateurs rather than experts. “Das ist meine Kritik an Wikipedia. Ich glaube, wenn man heute eine große Enzyklopädie zusammenstellt, dass man die Öffentlichkeit und auch die Experten und Expertinnen einbinden muss. Man muss da eine vernünftige Balance suchen. Wikipedia hat diese Balance noch nicht gefunden, denn die Amateure und Amateurinnen toben sich dort noch zu sehr aus während die Experten und Expertinnen einen zu geringen Einfluß haben” (Maier 2007). Here we may conclude that online tools such as Wikipedia are required to integration of both experts and public at reasonable degrees to ensure quality of content. Otherwise quality of content remains at a rather low level and therefore does not provide proper information and data on research.

What kind of effective counter strategies have been developed so far to fight the rising degree of plagiarism at universities? What kind of counter strategies are necessary to reintroduce quality assurance as far as teaching scientific discourse and scientific working for students is concerned?

In order to fight these negative and impeding factors on the development of science, Liebminger stresses the importance of developing counter strategies. Basically he discusses two types of strategies. First, intensifying control via software detecting plagiarism. “Das ist wieder die Kehrseite, dieselbe Technologie, die es den Plagiatoren und Plagiatorinnen erlaubt, leicht zu plagiieren, erlaubt es uns wiederum die Plagiate zu überprüfen. Es gibt mittlerweile schon exzellente Plagiats-Software und wir haben es jetzt an der Universität eingeführt, dass jede Abschlussarbeit, Diplomarbeit oder Dissertation bevor sie der Gutachter bzw. die Gutachterin bekommt, automatisch durch so eine Plagiat-Software geschleust wird. Wenn sich herausstellt, dass sie zweifelhaft ist, wird dieser Fall sofort untersucht und gegebenenfalls eben zurückgewiesen” (Liebminger 2008).

Unfortunately, this system of controlling causes a permanent atmosphere of mistrust, control and loss of confidence in students and their scientific work. Lieb-
minger considers this situation as a disadvantage concerning collaboration with students. “Ich möchte eigentlich nicht an einen Diplomanden oder eine Dissertantin prinzipiell mit der Einstellung herangehen, dass er oder sie wissenschaftlich unredlich ist und ich sie kontrollieren muss” (Liebminger 2008). Moreover, according to Denver it is often rather difficult to detect whether copying is done deliberately or on purpose. Sometimes the student may have copied material without fully understanding the rules (Denver 2008). The problem of plagiarism exists in New Zealand, too. Not in his department but in other parts of the university. Departments facing that problem use a highly effective detecting software program. Students have to submit their work electronically and then it gets checked for copying.

According to Sellers, fear of class action has formalized the process of detecting plagiarism at his university in Quebec. If a scientist suspects a student of plagiarism, he cannot deal with it individually. He has to go through the Dean’s office in order to get approval first. This procedure results in reluctance to persecute plagiarizers because it costs an enormous amount of time and energy to follow through when detecting cases of plagiarism. Even usage of software to detect plagiarism requires the approval of the Dean. Concerning fighting plagiarism he applies his personal traditional method. “I lock up the culprit and let him or her make an assignment. In case of plagiarism the results are so strikingly different then. That’s a convincing proof” (Sellers 2008). In contrast his science colleagues dealing with large classes are faced with more difficulties concerning plagiarism. Plagiarizers usually work in groups and that is one of the unpleasant aspects, Sellers argues.

Some scientists use their personal websites to fight plagiarism committed by students by providing instructions on doing research without plagiarism, on the methods of doing research, writing papers without copying ideas from other researchers and how to refer to those scientific sources.

Second, reintroducing critical reflections and scientific discourse in the curriculum from the very beginning. Students need to be trained from the beginning of their studies in properly dealing with scientific sources and argumentation techniques in science. “Schon bei den Studienbeginnern und -beginnerinnen ist größter Wert darauf zu legen, dass sie ein Gefühl dafür bekommen was wissenschaftliche Redlichkeit ist. Was es heißt mit fremden Quellen korrekt umzugehen, was ein Argument ist, was
wirklich ein eigenständiger Gedanke ist. Das muss man schulen”, argues Liebminger (2008). According to him, teaching and training methods of scientific working has to be integrated in traditional teaching and should not be part of online teaching. From his perspective different forms and methods of eLearning stress and push “diesen schlampigen Umgang mit Quellen und Texten.” This is one of the main reasons why he regards eLearning with skepticism. On the contrary forms of traditional teaching provide the ideal setting for learning how to properly deal with scientific texts and scientific arguing.

Summing up, shifting from traditional communication tools to electronic ones scientists are faced with rising quantity of information as well as a high degree of plagiarism concerning students’ works. Generally they do not blame students’ bad and incorrect manners when engaging in scientific discourse but negative impacts of technology on language use and changing communication styles. Especially email communication that has become the basic communication medium facilitates development of “lousy” communication techniques because emails make it so easy to do so. Time pressure on responding eliminates thorough reflections on content and proper language use. Moreover, electronic communication tools provide the basis for scientific works of low quality for reducing people’s ability on critically reflecting on and integrating content from the various sources provided by the Internet and the World Wide Web.

In order to sustain and re-establish quality standards scientists consider re-introduction of methods on critically reflecting, arguing, conducting scientific discourse into the curriculum from the very beginning as basic requirement to fight plagiarism, rising quantity of low quality content as well as decreasing knowledge on how to properly deal with scientific texts caused by technology. There is a great need to reintroduce education on scientific Netiquette in academic disciplines as well as to establish a better balance between issues of research and private groups to increase quality.
3. Personal Evaluation of Internet Communication

3.6. Face-to-face Required, Different Degrees of Digitization, No Cultural Differences

The qualitative analysis of my study shows that scientists regard face-to-face communication in professional activities and research as essential and the most effective tool. Regular face-to-face meetings are required to guarantee both quality and trust in collaborative work in research. Collaborations are based on trust and for this reason face-to-face-meetings are required on a regular basis to re-establish trust as reflected upon by Irving Winter in this respect.

From Winter’s personal experience it is difficult to start a project over email. He argues that to sustain a project, parties need face-to-face meetings every year or every six months as face-to-face-meetings restore confidence and show that collaborators are doing their best (Winter 2008). There is total agreement on that issue among all my interview partners. Referring to quality assurance we may generalize that collaborations and projects entirely conducted over email need regular face-to-face meetings for sustenance and building trust among its team members.

For scientists as digital immigrants the question of trust generally plays a highly critical role in dealing with electronic communication tools. This is one major contributing factor why scientists do not engage in frequent participation in chats or different types of discussion forum. Face-to-face meetings are essential and a basic requirement in professional communication argues Liebminger who demonstrates no professional participation in videoconferences, chats and different types of discussion forum. One of the main reasons for Liebminger refusing participation in videoconference, chat and virtual discussion forum is that he prefers engaging in discussions face-to-face. In this respect he argues as follows: “Wenn ich mit Menschen diskutiere, will ich mit Ihnen von Angesicht zu Angesicht diskutieren. Ich will im virtuellen Raum eigentlich nicht diskutieren.” He is not interested in professionally engaging in discussions in virtual space. Very rarely he would answer interview questions via email for it would be very dissatisfying for both parties. “Ich glaube, dass die sinnliche Präsenz, die Realität für bestimmte Kommunikationsformen unerlässlich ist. So einer Internetkonferenz oder einer Videokonferenz verweigere ich mich” (Liebminger 2008).
Helmut Maier describes himself as traditional and conservative dealing with videoconferences for he prefers face-to-face discussions in small groups. Moreover, he regards face-to-face meetings as more productive and efficient than videoconferences. Physically interacting and communicating with people not only includes elements of body language but also enables collaborating people to get to know each other much better. “Ich glaube auch, dass das viel produktiver ist. Wir haben unter Tags eine ziemlich dichte Tagesordnung und wir sitzen dann erst am Abend zusammen. Man lernt sich dann wirklich ein wenig kennen und man liest zwischen den Worten was die Leute eigentlich wollen und was sie nicht wollen. Das fehlt aber bei der Videokonferenz immer noch” (Maier 2007). In this respect he argues that the quality of videoconferences will improve in the future but there will be still a lack of reproducing the actual atmosphere of face-to-face communication. “Für mich wird eine Videokonferenz wirklich erst akzeptabel sein, wenn sie auch die Stimmung wieder gibt. Aber auf einen Bildschirm oder eine Projektionsfläche zu starren kommt mir nicht besonders entgegen. Ich mag das nicht besonders und ich glaube, dass das ein Generationenbruch ist” (Maier 2007).

According to the arguments above we see very clearly that videoconferences may not substitute face-to-face meetings. Most of my study participants rarely engage in professional participation in videoconferences. Some of them resist using this tool for professional communication as much as possible. When consulting international clients, Morrison, for example, prefers to go and have face-to-face communication (Morrison 2008).

According to his personal experience Denver points out that communication tools provided by the Internet and the World Wide Web are not totally substituting traditional forms of communication. Opportunities to interact and communicate face-to-face and attend conferences are still needed to guarantee quality in research. He refers to electronic communication as a still limited form of communication as research needs both electronic and traditional forms of communication. In this respect, I conclude that on the one hand technology such as the World Wide Web and the Internet are basic requirements to enable fast, synchronous and asynchronous international collaborations, even enhancing and promoting them. But on the other hand online communication is based on less reflections, less argumentation and therefore can easily lead to misunderstandings. Electronically collaborating actors
3. Personal Evaluation of Internet Communication

in research still need face-to-face communication and similar communication as well as working styles in order to cooperate successfully.

Face-to-face communication plays a highly important role as far as online teaching is concerned. According to my study findings most scientists still engage in traditional forms of teaching because they prefer to build relationships with their students face-to-face. They prefer to be in class with students, want to see their students laugh when they make a joke, for example. Additionally face-to-face teaching is regarded an important factor in teaching for face-to-face meetings with students provides students’ feedback on understanding and impacts of instruction issues to a higher degree than would be possible by online teaching argues Duchamp (2008). Since most collaborative work with students or technicians is done via emails Jeff Farmer has always tried to put electronic communication tools in respective with traditional ones. Though online communication facilitates work, he considers face-to-face communication still one of the most important tools scientists have with their students (Farmer 2008).

Summing up we may generalize that scientists belonging to the group of digital immigrants show a strong tendency to critically view online collaborations due to lack of face-to-face meetings or lagging behind with their expertise concerning online tools and thus need external impulses to start dealing with technology. Simon Lenz, for example, critically questioned quality of long distance collaboration without face-to-face meetings. At the same time he was convinced that communication among scientists had to take place face-to-face, but finally he engaged in successful cooperation on writing an article together with another scientist via email communication.

Considering traditional face-to-face meetings as the most efficient professional and personal communication tool is one of the main reasons for Friesacher as a scientist trying to personally resist the shift from traditional communication tools to electronic ones. “Bis zum heutigen Tag bin ich dabei geblieben, dass ich wichtige Dinge überhaupt nur im persönlichen Gespräch kläre. Wenn es wirklich um etwas Wichtiges geht, gibt es für mich überhaupt kein anderes Medium, auch keinen handgeschriebenen Brief. Normalerweise hat das eine Gespräch ausgereicht, um etwas endgültig zu klären; das heißt die Klärungen sind dann auch eineinhalb Jahre später
Scientists experience differences concerning the degree of digitization within scientific disciplines. Intensity of using tools of the Internet and the World Wide Web as well as the demand on it varies between Humanities and Natural Sciences due to various reasons. Degree of networking, access to scientific data such as digitized data banks and digitized journals tend to be higher in Natural Sciences than in Humanities. “In unserer Forschung ist es nicht so wie in den Naturwissenschaften, dass ich ein Team habe, das Versuche macht und die Ergebnisse von mir ausgewertet und präsentiert werden. Geisteswissenschaftler bzw. Geisteswissenschaftlerinnen machen ihre Forschung nach wie vor sozusagen im stillen Kämmerlein, in der Lektüre, im Vergleich, in der Analyse und das braucht eine gewisse Zeit, das braucht einen gewissen Ruhepunkt” (Müller-Mandl 2008). In this respect Humanities seem to need in certain aspects a different electronic behavior than Natural Sciences.

Some scientists refer to this difference in digitization when commenting on usage and maintenance of personal websites and weblogs, searching data, engaging in forms of electronic publishing as well as importance of citation indexes. In this respect, Müller-Mandl reports according to her professional experience that a shift from counting publications to looking at citations in Humanities is already visible, steadily progressing and that she expects a total shift from traditional publications to electronic ones in the future. “Im Augenblick gibt es aber noch einen sehr großen Unterschied zwischen den Geistes- und Naturwissenschaften,” Müller-Mandl remarks. In this respect she refers to a colleague in Natural Sciences who considers the Web as highly important publication tool for his research work. “Er hat einen Gedanken noch gar nicht fertig gedacht, noch nicht den ersten Buchstaben gesetzt und schon ist es im Netz. Das ist für ihn ganz wichtig. Das sind die Publikationsorgane, die mit Punkten versehen sind. Bei uns ist das noch nicht der Fall und wir kommen erst jetzt in diese Phase” (Müller-Mandl 2008).

In Natural Sciences digital publications are far more important than in Humanities where traditional publications are still predominant. “Wenn ich an die großen Vertreter und Vertreterinnen des Fachs denke, dann publizieren diese durchwegs nach wie vor noch auf dem Papier,” comments Müller-Mandl. Scientific discipline

noch in Ordnung. Auf diesen Punkt, das ist sicherlich eine Besonderheit, wollte ich nie verzichten” (Friesacher 2009).
3. Personal Evaluation of Internet Communication

presents an impact factor on open access is argued by Thunder who is in “favor of trying to open things up rather than closing them down.” He points out that social scientists do not worry about commercializing intellectual property very much as they do not seem to have any ideas that are commercial. Scientists of engineering, for example, have quite different views, he would argue (Thunder 2008). As far as technical sciences are concerned Maier experiences a strong tendency to access electronic sources whereas historians or ethnologists need to access documents, original sources and printed volumes for their research work (Maier 2007).

Drawing my final conclusions on scientific disciplines and differences in degrees of digitization we have to take into account that on the one hand the scientific field represents a critical factor for the motivation to engage in open access as well as using the tools provided by the World Wide Web and the Internet to its full extent. Especially during these transitional stages those fields with minor digitization, showing a tendency of lagging behind when dealing with technology will experience growing pressure to shift from traditional tools to electronic ones. But on the other hand there are no opportunities to escape this steadily and rapidly growing shift, since technology has become a standard medium at universities and in a scientist’s professional life.

Finally, my study results show that cultural differences are no impact factors as far as usage and implementation of electronic tools in the field of science are concerned. My previous assumption that there exist cultural differences in acquiring and operating these tools turned out to be wrong. Scientists of the geographical areas I focused my research on – Austria, Quebec, New Zealand - hardly reported on experiencing cultural differences. For this reason the qualitative analysis of my study did not show differences that are relevant for my research.

Dealing with my interview candidates from Quebec I introduced one more category called “language shift” in my study analysis as the official language in Quebec is French and not English. In contrast the official language, the Lingua Franca of the World Wide Web and the Internet is English. The qualitative analysis did not reveal any cultural differences that are of scientific relevance as far as language use is concerned. According to my interview partners in Quebec we may conclude that a shift to using both languages French and English has already been made as all in-
ternationally operating researchers in Quebec write their articles in both languages English and French. Email communication is conducted in both languages too and it is the same with other electronic communication tools. Both languages are used for professional communication but usage of English is predominant.

Duchamp, for example, always wrote his articles or drafts in English. He never used a person to translate his texts from French to English. He has been working with a close friend who shows a good command of English and therefore would look at his English texts and improve them if necessary. Moreover, they use proofreaders who would invest about an hour in their English texts one last time. From his personal experience not all researchers in Quebec have shifted from French to English. It varies a lot on the field as in some fields the French community is very active and in others less. Being involved in a relatively worldwide initiative there is no choice. But he has colleagues who write mostly in French for collaborating with people in France, for example, or their French speaking community is large enough to mostly communicate in French (Duchamp 2008).

Those scientists with French, British or Australian origin have already turned into bilinguals. Since Jeff Farmer’s origin is Australian he had to shift to French for teaching and professional communication at his university in Quebec. Working at a French University means that most colleagues are French speaking, so he would use both languages. Concerning professional communication he demonstrates usage of both languages but usage of English is predominant. He would use French for collaborations in Quebec or France whereas for international collaborations he uses English. Additionally, email communication is mostly done in English. He uses both languages for his publications, but again publications in English are predominant. Moreover, he would use French for presentations in Quebec or for students. Most of his publications with his students are in French. Finally, grant proposals or reports done in Quebec are in French as well. English is predominantly used for professional communication outside Quebec and worldwide because the audience is wider with English than with French (Farmer 2008).

Peter Thaxter’s origin is British and he had to shift to using French for teaching and instruction, too. He teaches at a French speaking university but English is mainly used for professional communication using online tools. He would engage in draft-
ing texts required in French in English first and then translate it into French. Concerning usage of language when writing articles depends on who has commissioned it or for which journal or which public it has to be written. Most of his writings are in English (Thaxter 2008).

Guilbert Lacroix, bilingual by nature for he was brought up bilingually, has shifted to using English for professional communication. Generally he would use the language he is addressed in by people and in case it is in English even from a French-speaking student he would answer in English out of politeness. Concerning his publications he would use both languages. He demonstrates a natural tendency to write only in English but when he is solicited, he would use the language he is asked to write in. For French journals he would write in French.

Not all researchers belonging to the old academia in Quebec are bilingual by nature. Some of his colleagues, for example, draft their texts in French and then translate them into English. These people are not really bilingual. They speak English well, but concerning writing they use French first and then ask someone to translate it whereas for the younger academia bilingualism is natural and required when entering university (Lacroix 2008).

In this respect, I draw the conclusion that English is the predominant language for research and research work. French is used for university correspondence and teaching purposes. Luchard points out that he works mostly in English and that French is sort of his teaching language. Apart from a few exceptions as at the time I conducted the interview he was preparing a paper in French, but everything else including his blog posts he would do in English. Those he considers important for his students he would do in French. A lot of communication with people is conducted in English and usually French is used at home or for his university writing. As far as his research is concerned he tends to actually work in English. As far as teaching is concerned English is the first language and French is used second (Luchard 2008).

John Sellers, from French origin, basically demonstrates usage of both languages for professional communication but usage of English is predominant. English is mainly used for email correspondence and it is the main language he uses for web communication. In Quebec he points out that a language politics jargon is called “English
3. Personal Evaluation of Internet Communication

is my working language” (Sellers 2008). In this respect it becomes evident that scientists have already shifted to using both languages whereas English is predominantly used for communicating via web tools.

Summing up and referring to the descriptions and analysis on language use of scientists in Quebec Canada we see very clearly that scientists use both languages for their professional activities. When working at a French speaking university they use French as their working language, which means that university writings and teaching is done in French. In contrast, in dealing with online communication as well as international collaborations English is predominantly used. Moreover, digital publications are done in English since scientists reach a wider audience when publishing in English. In this respect, I conclude that the shift to using the Lingua Franca of the net is fully completed even by digital immigrant scientists of the old academia. The only exception is formed by a small group of scientists who basically collaborate within the French speaking community and do not engage in internal collaborations.
4. Communication Patterns and Types

4.1. Communication Patterns

The following table shows the shift from traditional communication patterns to online communication patterns.

**Table 4.1.: Comparison of Communication Patterns**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Traditional Communication Patterns</th>
<th>Online Communication Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correspondence</td>
<td>Letters</td>
<td>Emails</td>
</tr>
<tr>
<td></td>
<td>Faxes</td>
<td>Emails</td>
</tr>
<tr>
<td></td>
<td>Phone calls</td>
<td>Emails</td>
</tr>
<tr>
<td>Teaching method</td>
<td>Face-to-face</td>
<td>Online mixed with face-to-face sessions (“Blended Learning”)</td>
</tr>
</tbody>
</table>

*to be continued...*
### 4. Communication Patterns and Types

<table>
<thead>
<tr>
<th>Categories</th>
<th>Traditional Communication Patterns</th>
<th>Online Communication Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching material</td>
<td>Printed scripts, course guidelines and books</td>
<td>Scripts, course guidelines, general information available online as PDFs at university website, personal website or personal blog</td>
</tr>
<tr>
<td>Paper reviewing</td>
<td>Sending and receiving papers as email attachment or via mail</td>
<td>Online reviewing by experts using and following online instructions on the editors’ websites; website URL sent by email</td>
</tr>
<tr>
<td>Paper publishing</td>
<td>Sending and receiving printed version as PDF via email or mail</td>
<td>Online publishing on publishing websites, university websites, personal websites or personal blogs as HTML files and PDFs Online publishing in online journals and online paper submission</td>
</tr>
<tr>
<td>Book publishing</td>
<td>Printed version</td>
<td>electronic and/or printed version</td>
</tr>
</tbody>
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*to be continued…*
## 4. Communication Patterns and Types

<table>
<thead>
<tr>
<th>Categories</th>
<th>Traditional Communication Patterns</th>
<th>Online Communication Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to scientific material</td>
<td><em>Restricted access:</em> physically going to the library, ordering books and lending them for a certain period of time</td>
<td><em>Open access:</em> online libraries, virtually going to libraries worldwide, download material and print it</td>
</tr>
<tr>
<td>Collaboration with scientists</td>
<td><em>Group:</em> face-to-face collaboration in conferences, workshops, talks, in private; sending papers and articles; phone calls, printed newsletters; conferences very expensive and one may just attend a few a year You had to belong to a certain community to have access to certain material</td>
<td><em>Network communities:</em> most of the collaboration done by email or parts of the collaboration are done by email; usage of certain collaboration tools such as Skype, Evo, Access Grid etc. or community blogs, websites and blogs for presenting the personal scientific profile: CV, talks and presentations, projects, memberships, cooperations and publications; used for providing information such as announcements, scientific discussions and comments, setting impulses for discussions, raising certain scientific issues</td>
</tr>
</tbody>
</table>
4. Communication Patterns and Types

<table>
<thead>
<tr>
<th>Categories</th>
<th>Traditional Communication Patterns</th>
<th>Online Communication Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration with students</td>
<td>Face-to-face in the lecture hall, office hours, phone calls, emails</td>
<td>Partly online teaching, a major part still face-to-face teaching for the “human touch”, the “bodily interaction” is still wanted and needed; online teaching involves collaboration tools such as Skype</td>
</tr>
<tr>
<td></td>
<td>Papers to be handed in at the office of the department</td>
<td>Official websites (university website) and personal websites or blogs used for uploading course material, uploading tips and information for students</td>
</tr>
<tr>
<td></td>
<td>Blackboard at the department</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Printed newsletters, dissemination prints and university papers</td>
<td></td>
</tr>
</tbody>
</table>

| Job application             | Letter of application                                                                               | Electronic application form                                                                       |
|                             | Mail reference material                                                                             | Email and attachment                                                                               |
|                             | Job interview face-to-face                                                                          | Job interview via video conference                                                                 |

Table finished

4.2. Communication Types and their Definitions

The analysis of my interviews shows that implementation of electronic communication tools provided by the Internet and the World Wide Web has caused transformation processes concerning scientists’ communication behavior. Due to operating, using and implementing these tools scientists have been gradually changing their communication patterns and developed a new habitus and new types of communicating and interacting within the scientific field. Broadly speaking there is an un-
limited amount of already existing and newly emerging communication types since scientists are still struggling with transitional stages as far as communication technology is concerned or resist operating, implementing online communication tools to different degrees into their professional activities as scientists and researchers.

In this respect analytical construction of these individual communication types is impossible because these different types cannot be separated accurately. There is a bandwidth of multiple and various types where any position is likely to occur for scientists when shifting from traditional communication tools to online tools provided by the Internet and the World Wide Web. From a theoretical point of view these communication types may differ but actually there are smooth transitions. According to my study I identify four “communication prototypes” that gather the categories I used to analyze and describe these transformation processes. In the following sections each of the four prototypes of communication is defined and explained by the categories that make up a certain communication type. But at the same time we must be aware of the smooth transitions and the bandwidth of types within each prototype of communication.

4.2.1. The Enthusiast

The profile of the enthusiast shows a very high degree of web presence as well as intensive usage of online tools provided by the World Wide Web and the Internet. Broadly speaking, the enthusiast among the scientists is a person who has totally shifted from traditional tools to using online tools for professional activities in science and research. This type of scientist has already successfully passed transitional stages others are still struggling with and thus naturally engages in effectively operating online communication tools. In contrast to scientists who demonstrate total or partial resistance concerning implementation of the Internet and the World Wide Web, the enthusiast fully recognizes the advantages of electronic tools for scientific work and uses these highly effectively to benefit his/her work as a scientist.

The enthusiast experiments with and uses all online communication channels provided by the Internet and the World Wide Web in order to test these for effective, efficient usage and implementation in science and research. The Internet and the
World Wide Web have become standard tools as well as a basic requirement for professional activities as a scientist and researcher. He/she is bilingual by nature or English-speaking native and for this reason does not experience difficulties or disadvantages as far as the Lingua Franca of the web is concerned. Online tools are already used as a kind of fighting tool for gaining positions and career building within the scientific field.

Email communication is intensively used as basic medium for professional and personal communication. In contrast to other communication prototypes the enthusiast, being aware of the dangers of distraction caused by emails as people get easily trapped in spending too much time on dealing with email management, he/she has developed certain proven strategies respectively methods to deal with incoming mails effectively in a very limited amount of time. The enthusiast mainly personally manages his/her mails and instantly does some action to all incoming mails in order to keep the inbox empty all the time since email communication is essential for professional activities as well as national and international collaborations. Usage of effective spam filters, filing, archiving, and delegating mails to support staff are basic methods for effectively managing email correspondence.

The enthusiast experiences distractions rather from traditional communication channels such as phone calls, face-to-face meetings, colleagues and other issues that need to be settled at the office rather than from mail correspondence or operating online tools provided by the Internet and the World Wide Web when engaging in research and scientific work. For this reason working at home is regarded an important factor for success in research since it helps to be more productive concerning research work due to lack of distractions. Working at home, enthusiasts tend to be more successful in research, for example, for they do not get distracted by the Internet and the World Wide Web like other scientists who are still struggling to fight distractions caused by online communication tools. Enthusiasts easily substitute traditional communication tools by online tools.

The enthusiast regards websites and personal weblogs as excellent tools for publishing and promoting research work. Apart from the official website provided by the university or the department he/she keeps and maintains both a personal website and a personal weblog. Basically website and blog entries are kept in the Lingua
4. Communication Patterns and Types

Franca of the web or in case of a bilingual language area in two languages. Since the official website only presents a limited personal profile the enthusiast uses the personal website for providing basic information on professional life, publishing and promoting research.

A personal weblog is regarded as a very powerful and innovative tool by the enthusiast as it provides formal and informal communication. Enthusiasts want to get some extra information about a researcher, when they are interested in a researcher’s work. This information is not provided in papers and websites that are fairly static. Maintaining a personal blog assists the enthusiast to show which scientists he/she is collaborating with as well as the research issues he/she is interested in, which scientific networks he/she is part of or connected with. Blogs highly support network dynamics, facilitate networking, building research communities and are therefore highly effective communication tools for the enthusiast to share ideas, material and collaborate globally.

The enthusiast frequently participates in professional videoconferences and chats. He/she would effectively integrate the collaborative software tool Skype, for example, in his/her online courses for administrative purposes such as setting up meetings, someone discussing a program and some teaching issues. Online courses are the primary means of teaching and he/she rarely engages in traditional teaching. Generally the enthusiast prefers online teaching to traditional forms of teaching and thus demonstrates a high degree of knowledge in operating online instruction tools as well as Learning Management tools. Synchronous time is a critical factor for the enthusiast as he/she regards it more expensive than asynchronous time. Synchronous time activities cause distraction for the enthusiast. This is one of the reasons why he/she prefers online to face-to-face teaching.

Moreover, the enthusiast makes intensive usage of Wikis for research, management, and collaborating issues with other researchers and graduate students. In this respect the enthusiast demonstrates a strong preference for micro collaboration, micro research. He/she tends to work in small bits at a time and other scientists collaborating with him/her contributing small bits each time using collaboration tools such as Wikis, Google Docs, online Office Suites and others. The entire process of creating a paper in collaboration with other scientists or graduate students is done
4. Communication Patterns and Types

through micro communication, kind of quantum collaboration and that means that quantum elements (pieces of information) are basically sent back and forth. The basic procedure of micro collaboration consists of the following steps: the document is taken out and worked on for a while, then it is put back on the server so that other people can work on it. Subscription to RSS Feeds and Wikis allow the collaborators to monitor the changes until the paper is finished and be submitted.

The enthusiast predominantly publishes digitally since he/she considers digital publications as necessary if scientists want their papers and research work to be read by more people all over the world. Due to digital publications more people get access to a scientist’s work and therefore result in rising reputation within the field of science. Additionally, the enthusiast uses the Citation software such as Google Scholar to browse papers electronically and look at citations. For the enthusiast the Citation Index measures a researcher’s reputation better than the quantity of publications. So he/she publishes digitally in order to cater for people to read his/her work electronically to make him/her more successful as a scientist.
4. Communication Patterns and Types

**Attributes of the Enthusiast**

- Very high web presence and intensive usage of online tools
- Online tools used as fighting tools for career building
- Most have not yet reached top position in scientific field
- Bilingual by nature, English-speaking native
- Official website, maintaining personal website and blog in two languages
- Email communication basic medium for professional activities
- Developed effective strategies for email management
- Mainly personal email management, spam filters, filing, archiving, delegating mails
- Predominantly online teaching
- Predominantly electronically publishing
- Citation Index effective measuring tool
- Usage of citation search engines
- Frequent participation in videoconferences and chats
- Online memberships

_Wants to have it all. Easily substitutes traditional communication tools by online tools. Successfully implementing these in professional activities as a scientist and researcher._

**Table 4.2.:** Attributes of the Enthusiast
4. Communication Patterns and Types

4.2.2. The Shifter

The profile of the shifter shows a high degree of web presence as well as intensive usage of online tools provided by the Internet and the World Wide Web. The shifter among scientists is a person who has almost totally shifted from traditional communication tools to online communication tools. Most shifters have successfully passed transitional stages whereas some are still struggling with certain stages. Like the enthusiast, the shifter is aware of the advantages of digital tools for scientific work and uses some of these highly effectively to benefit for his/her work as a scientist and researcher.

Shifters generally have a strong tendency to experiment with digital communication tools provided by the Internet and the World Wide Web in order to implement these effectively into their professional activities. The Internet and the World Wide Web have become standard tools as well as basic requirement for doing research and engaging in collaborative scientific work. He/she is English-speaking native or bilingual whereas English the Lingua Franca of the web has been acquired as second language during various sabbatical leaves in English speaking countries. For this reason shifters are not disadvantaged or experience any difficulties as far as usage of the Lingua Franca of the web is concerned. Online tools are not really used as fighting tools for gaining positions and building up a career but rather to provide open access to all research projects and establish new forms of national and international collaboration.

Email communication is intensively used as basic medium for professional and personal communication as well as collaborative work. Some shifters would use email communication even for writing books with co-authors. The shifter mainly personally manages his/her incoming mails and has already developed certain strategies to effectively deal with incoming mails such as splitting the day into small email units for effectively managing these. Usage of spam filters, filing, archiving, and delegating mails to support staff are basic methods for effectively managing incoming mails. Some shifters would install as many spam filters as one can have. Generally, the degree of delegating mails to support staff is apart from a few cases rather low. Some shifters engage in high degree of delegation whereas others do not delegate incoming mails at all.
Additionally, they show high frequency of checking mailboxes for incoming mails and use mail reporting systems. Most of them follow basic Netiquette rules when composing email but this practice does not play a highly critical role for the shifter. The shifter experiences mail management as time consuming, sometimes even as pain and as distraction from the workflow when engaging in scientific work. For this reason he/she would turn off the mail reporting system and go offline to be able to continuously work on an article or book chapter, for example.

The shifter regards websites as excellent tools for publishing and promoting research work. Websites are used to provide open access to research projects including documentation of the projects, materials, surveys and evaluation or to create a resource web where people can provide and gather information worldwide. Apart from the official website of the university or the department only a few shifters maintain a personal website for they may publish their work and make it publicly known without any permission or anybody objecting it. Moreover, they provide all information, material and administrative issues on teaching courses. Finally, informal parts of information are integrated and discussed. Some integrate publication of private matters in form of yearly Christmas letters or uploading a series of photos.

Shifters do not keep and maintain a personal weblog. Mostly there is no need for them since official or personal websites provide sufficient web presence for teaching, research as well as presenting their professional profile. Others critically question the value respectively quality of blogs or blog entries for scientific work and scientific discourse. Apart from a few exceptions shifters rarely engage in posting comments but they visit blogs and subject related websites to different degrees. Some would frequently visit websites and weblogs for professional reasons, others rather rarely.

Generally shifters participate professionally in videoconferences and chats but the degree of engagement varies among shifters. Some intensively engage in videoconferences and chats using effective and free software products that provide all opportunities for conducting larger meetings, well functioning and effective collaborations among scientists and researchers. Some are still very traditional and do not participate in videoconferencing or chats for professional activities at all but they would occasionally use Skype, for example, for private communication when abroad.
4. Communication Patterns and Types

or with students in case of long distance calls. They critically question if videoconferences can substitute face-to-face meetings and thus do not bother to participate in these online communication tools.

Other shifters who professionally and personally engage in videoconferences, chats and discussion forums regard face-to-face meetings as more productive and efficient than videoconferences, for example. As far as videoconferences are concerned they consider themselves as traditional and conservative or even as digital immigrants for they prefer face-to-face discussions in small groups and thus critically question the quality of videoconferences. But as scientists they experience growing pressure to engage in videoconferences for collaborative work. Additionally, they would frequently engage in phone conferences.

Some shifters rarely engage in professional participation in videoconferences and chats due to lack of time. These scientists do not conduct videoconferences regularly with colleagues, students, and friends. They are not asking for many videoconferences although they like them. Chats with colleagues and friends are conducted rarely but they would generally avoid conducting chats with students since having a large number of students there are always some who are likely to misuse chats for asking unimportant matters.

Finally, there are shifters who participate professionally in videoconferences to an average degree. Especially, when traveling they engage in private videoconferences and due to the advantages for work integration and usage of videoconferences via Skype will be used for future collaborations with labs as well. Additionally, they professionally engage in videoconferences for conducting final exams with PhD students from abroad, and committee meetings for graduate students from other parts of the country.

Most shifters generally do not participate in various types of discussion forum. A few frequently engage in this type of online communication for they experience a high degree of learning and entertaining potential when actively using it. Generally shifters are members of mailing lists and online journals.

The shifter predominantly engages in traditional lectures as far as teaching is concerned. Most of them are involved in traditional teaching courses only whereas some
use traditional teaching methods with a few online components. Often these online components of a course are delegated to assistants and staff members. A few shifters teach both online and traditional courses. Teaching material, student information, and administrative issues are provided on the shifters' website for download.

Shifters mostly publish both traditionally and online. Their scientific work is available as pdf downloads on websites and/or in printed form such as books or articles. Additionally, they publish in online journals. Only a few predominantly engage in traditional forms of publication. Most publications are printed at hand and a few online articles are published in online journals. Some have already totally shifted from traditional forms of publications to digital ones. All publications are basically done electronically for most of the journals they publish in are online journals and offer rapid electronic submission. Concerning reviewing papers they use online reviewing tools, too.

Considering and valuing the Citation Index an appropriate measuring tool for a scientist's reputation varies a lot among shifters as scientists and researchers. Some regard it a highly effective tool for measuring a scientist's reputation and quality of his/her scientific work while others critically question its value for scientific reputation and do not care about Citation Indexes as for them these are ineffective tools for ratings. Some hardly check Citation Indexes and do not really use software programs for citations since they have never been a believer in counting publications. Others generally do not search for citations of their scientific work and thus do not use software programs such as Google Scholar or CiteSeer for citations in order to measure the impact of their work. In contrast, those shifters who regard citations as a highly effective measuring tool for a scientist's work check Citation Indexes quite a lot when looking at other people in their field. From their point of view citations properly used are more accurate in research and are much more influence than a collection of publications.
### Attributes of the Shifter

- High to average web presence and high to partly usage of online tools
- English-speaking native, bilingual - English second language
- Online tools are rather used to provide open access to research work and facilitate international collaborations rather than fighting tools for career building
- Most hold top position in scientific field
- Official website, some maintaining personal website but no weblog
- Email communication basic medium for professional activities
- Developed effective strategies for email management
- Mainly personal email management, spam filters, filing, archiving, delegating mails
- Frequent to rare professional visits of websites and weblogs
- Rare engagement in posting comments
- Predominantly traditional lectures, some integrated online elements often delegated to assistants and staff
- Traditional and online publications, some predominantly online publications

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*to be continued…*
4. Communication Patterns and Types

<table>
<thead>
<tr>
<th>Attributes of the Shifter</th>
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<tbody>
<tr>
<td>• Citation Index high effective to no measuring tool</td>
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<tr>
<td>• High to low or no usage of citation search engines</td>
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<tr>
<td>• High to rare or no professional participation in videoconferences and chats</td>
</tr>
<tr>
<td>• Generally no participation in different types of discussion forum, a few show high frequency of participation</td>
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<tr>
<td>• Online memberships</td>
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Substituting and shifting from traditional communication tools to online ones with some reservations on these tools in regard to their efficient, effective usage and impact on professional activities of a scientist and researcher.

Table finished

4.2.3. The Laggard

The profile of the laggard shows an average to low degree of web presence as well as partially reluctant usage of online tools provided by the Internet and the World Wide Web. The laggard among scientists is a person who has only partially shifted from traditional communication tools to online communication tools. Most laggards are still struggling with the problems of transitional stages. On the one hand they are fighting to overcome technological difficulties, but on the other hand there are some who consider themselves consciously as traditional and thus resist implementing certain online tools into their professional activities. Unlike the enthusiast or the
shifter the laggard is not fully aware of the advantages of electronic tools for scientific work and due to lack of experimenting with them may only effectively use these to benefit for his/her work as a scientist and researcher to some extent. Others are convinced that the benefit from traditional communication methods is higher than from using online tools. For this reason they would only use those tools they experience professional advantages from but resist those that cause impediment for their scientific work.

Laggards generally have a reluctant tendency to experiment with digital communication tools provided by the Internet and the World Wide Web in order to implement these into their professional activities. The Internet and the World Wide Web have not yet become fully standard tools as well as basic requirement for doing research and engaging in collaborative scientific work. He/she is an English-speaking non native, English-speaking native or bilingual whereas English, the Lingua Franca of the net, has been acquired as second language during sabbatical leaves, professional stays in English speaking countries for a longer period of time or simply moving to an English speaking country. For these reasons, some laggards are disadvantaged or experience difficulties as far as usage of the Lingua Franca of the net is concerned. Online tools are not used as fighting tools for gaining positions and building up a career yet but rather as facilitation and acceleration concerning professional communication, establishing collaborations worldwide and data research.

Email communication is intensively used as basic medium for professional and personal communication as well as collaborative work. A few laggards would use email communication for writing articles with co-authors or carrying out collaborative work such as research projects via email correspondence. The laggard mainly personally manages his/her incoming mails and only a few delegate parts of mail correspondence to assistants or secretaries, for example. Most of them have developed certain strategies to deal with incoming mails effectively. Some, for example, engage in total personal management and do not delegate mail correspondence at all unless it is to an extremely competent and circumspect person. They would check their mailboxes on a regular basis and engage in instant personal dealing with email correspondence during a reserved period of time. Laggards try to respond to incoming mails within relatively manageable amount of time aiming to avoid pressure of in-
4. Communication Patterns and Types

stantaneous reactions reserving certain amount of time such as one to two hours a day for personally managing mails.

Most laggards instantly deal with incoming mails and check their mailboxes frequently, some at least once an hour whereas others at least twice a day. Some use a mail reporting system, others keep it turned off most of the time or even do not bother installing one since it causes a distraction for their workflow when engaging in scientific work. Most laggards demonstrate strict self-discipline and self-control dealing with incoming mails but there are a few who are still struggling to fight distractions caused by mail correspondence. Composing and reading emails sometimes even is fun for them and they have to set up strict discipline rules to fight these (pleasurable) distractions. They turn off their mail reporting systems, for example, and engage in off line periods withdrawing themselves from the Internet. Finally, usage of effective spam filters, filing, and archiving are general methods for effectively managing email correspondence.

As far as Netiquette rules are concerned, most laggards follow basic rules and still use letter-writing style when communicating via email. Some laggards consider usage of strict Netiquette rules highly important when dealing with email communication. They would always manage their mails courteously, starting with a salutation, ending with appropriate closure, and addressing people by name, for example. Others differentiate between formal and informal mails and would only partly follow Netiquette rules depending entirely on the person addressed to. Especially, when dealing with administrative problems some laggards would use bureaucratic language keeping them as brief as possible. On the contrary they engage in both formal and informal communication when corresponding with their students due to lack of face-to-face meetings. A few laggards keep their mails drastically short sometimes even not more than two-word mails, for example. Additionally, a few laggards prefer to add an emotional and individual Netiquette rule in their personal protocols signing mails, for example, in order to make it slightly individual and maintain a human contact.

Apart from a very few exceptions, laggards generally do not keep and maintain a personal website. Most laggards use their official websites for publishing, promoting their research work as well as providing their professional profile. Those who
4. Communication Patterns and Types

maintain their personal websites and personally update these do not only use them for publishing and promoting their research work but also for providing basic information for students and colleagues on their research areas and professional activities. Moreover, they provide teaching material and information on teaching courses. They personally and regularly update central information such as examination dates for students, dates of their talks or public appearances. As far as publications are concerned a few prefer to publish a rather limited number of texts at their websites because they do not consider the “virtual world” an ideal location for their publications and still follow traditional forms of publication. Texts published on their websites are rather provided as “appetizers”, part of a documentation or link to their professional portfolio in science and research.

Laggards keeping a personal website usually create it in the language of the geographical area or content they come from and not necessarily (only) in the Lingua Franca of the web. The field of study and importance of international reputation are impact factors for laggards which language/languages they are maintaining their personal websites in. A few would keep it in several languages such as English, French and German, for example. Laggards coming from a bilingual area such as Quebec naturally maintain their personal websites in French and English. Moreover, they include parts in the language they do a lot of research in. In one case it is German since the researcher does a lot of research work there and thus wants to make it accessible for German speakers. But keeping a website or a weblog in three languages is rather unusual in the field of science.

Laggards do not keep and maintain a personal weblog. Mostly there is no need for them since official or personal websites provide sufficient web presence for teaching, research as well as presenting their professional profile. Others critically question the value or quality of weblogs or blog entries for scientific work and scientific discourse. In contrast a few laggards would like to create their personal weblogs in order to use it for pre-publications, presenting, discussing new ideas, enabling networks and providing a pool of projects.

Apart from posting comments in learning management tools as feedback for students laggards generally do not or very rarely engage in posting comments because they consider postings of low quality, superficial and of no value for scientific dis-
4. Communication Patterns and Types

course. Some rarely read postings and comments. Most of them would visit subject related websites and weblogs in order to search for information and inform themselves on the latest developments on certain scientific issues relevant for their research work, teaching, and projects to various degrees. A few do not visit weblogs at all because they regard blog entries as very one-dimensional. In contrast, there are a few laggards who regularly read friends’ blogs on articles about the political situation in certain countries or visit a website on the best international journalists’ article in daily newspapers for relaxation, stimulation of the brain and improving writing skills as an academic.

Frequency of participation in videoconferences varies a lot among laggards. Most laggards do not engage in videoconferences for professional activities due to their strong preference for face-to-face communication, lack of motivation to engage in professional discussions with anonymous people or lack of knowledge on digital communication technology. Some are rarely involved in videoconferences, for example, in job interviews being part of an (interview) team interviewing scientific applicants. Moreover, they occasionally participate in online meetings with staff on a remote campus. A few laggards demonstrate an average degree of participation in videoconferences since they are involved in research groups that sometimes engage in videoconference discussions, or in the process of selecting staff faculty coming from abroad, or telephone conferences. Finally, a few laggards demonstrate high frequency of professional participation in videoconferences and telephone conferences especially when dealing with international projects.

Most laggards do not professionally participate in chats at all. A few rarely conduct chats but rather on personal issues than professional ones. Generally, they do not engage in posting comments for academic purposes due to lack of time for critical reflections or considering face-to-face communication as essential for scientific discourse.

Generally, most laggards are members of mailing lists and online journals since they are members of scientific societies, distribution and research networks. A few refuse membership due to an increased quantity of mails and in case they have already become a member they would ask to be removed from the mailing list. Most laggards
try to limit their membership in mailing lists and online journals since it results in information overload and increase of incoming mails.

The laggard predominantly engages in traditional lectures as far as teaching is concerned. Most of them are involved in traditional teaching courses and only a few integrate online elements such as working online basically via emails and attachments with doctorate students or integrating the Internet in a few online courses providing an outline of the problem requiring students to go online for more details, more precise definitions or illustrations. Others just started to integrate Wikis and blogs in graduate courses in cooperation with a colleague demonstrating a high command of electronic communication tools whereas they themselves have a vague idea what Wikis and blogs are and how to effectively operate these. Only a very small number of laggards teach both online and traditional courses.

Laggards predominantly publish the traditional way. Some engage in traditional publications only whereas others have already started to publish some articles on websites and in online journals or magazines since the number of these has been rising. Very few laggards engage in both traditional and online publications. Some are involved in online reviewing doing evaluations for submissions for online journals.

As far as the Citation Index is concerned, most laggards have noticed a growing importance of digital publications dealing with scientific reputation but they themselves value it to different degrees for their personal scientific reputation. Some laggards pay less attention to the Citation Index as a measuring tool for a scientist’s reputation and thus hardly check for citations using Citation software. Some occasionally search for citations whereas some use it to check it for judging their ranking, for example. In contrast a few laggards consider the Citation Index an ineffective tool for measuring a scientist’s reputation. Sometimes they would use Google Scholar or CiteSeer for searching for citations but due to their personal experience such tools present an incomplete picture of a scientist’s work.
Table 4.4.: Attributes of the Laggard

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<th>Attributes of the Laggard</th>
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<tbody>
<tr>
<td>• Hesitant/average to low degree of web presence and only partial usage of online tools</td>
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<tr>
<td>• English-speaking non-native, English-speaking native, bilingual – English second language</td>
</tr>
<tr>
<td>• Most hold top position in scientific field</td>
</tr>
<tr>
<td>• Still struggling with problems of transitional stages</td>
</tr>
<tr>
<td>• Very traditional resisting implementation of certain online tools in professional activities</td>
</tr>
<tr>
<td>• Lack of awareness of advantages derived of online communication tools</td>
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<tr>
<td>• Fighting to overcome technological difficulties</td>
</tr>
<tr>
<td>• Reluctant tendency to experiment with online communication tools</td>
</tr>
<tr>
<td>• Online tools not used as fighting tools for gaining positions but as facilitators, accelerators for professional communication, global collaboration and data research</td>
</tr>
<tr>
<td>• Email communication basic medium for professional activities</td>
</tr>
<tr>
<td>• Developed effective strategies for mail management to some extent</td>
</tr>
<tr>
<td>• Mainly personal email management, spam filters, filing, archiving, delegating mails</td>
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to be continued…
## Attributes of the Laggard

- Basic Netiquette rules and letter writing style to very short emails
- Official website, only a few maintaining personal website but no weblog
- Rare engagement in posting comments
- Rarely reads comments
- Frequent to rare professional visits of websites and weblogs
- Predominantly traditional lectures, a few both traditional and online teaching, a few integrated online components
- Predominantly traditional publications, a few traditional and online publications, some online publications
- Online reviewing
- Citation Index high to no effective measuring tool
- Average to rare or no usage of Citation software
- High to rare or no professional participation in videoconferences
- Rare to no professional participation in chats
- No participation in different types of discussion forum
- Online memberships

*to be continued…*
4. Communication Patterns and Types

Attributes of the Laggard

| Wants to see the benefits first. Not convinced that substituting traditional communication tools by online tools is always adequate and thus they consciously resist. They still lack effective strategies in dealing with these tools and lack of knowledge to effectively operate them. |

Table finished

4.2.4. The Dinosaur

The profile of the dinosaur shows no or extremely low degree of web presence as well as no or strictly limited usage of online tools provided by the Internet and the World Wide Web. Generally speaking the dinosaur presents a scientist trying to totally resist the shift from traditional communication tools to online ones. The dinosaur is conservative and very traditionally oriented concerning implementation of digital technology into his/her professional activities as scientist and researcher. Face-to-face meetings and traditional letters are the most appropriate professional and personal communication tools for dinosaurs to efficiently deal with personal and professional issues in the field of science. Additionally, lack of intrinsic motivation in acquiring knowledge on operating digital technology and developing skills make the dinosaur an outsider concerning online tools provided by Internet and the World Wide Web.

Dinosaurs are usually in a privileged situation for retiring soon and thus being at the end of their professional career. They are not seeking any further career and do not need to use the Internet or the World Wide Web as fighting tool for building a career within the field of science. They are totally aware of their role as outsiders as well as belonging to a species that will be soon distinct.
Contrary to enthusiasts, shifters, and laggards, dinosaurs engage in total avoidance to use email as basic medium for professional and personal communication. Most of them have been successfully fighting high quantity of incoming mails as well as only marginally engaging in email correspondence by using certain strategies to avoid email communication as much as possible. First, all dinosaurs treat mails as subordinates. Second, requests are expected in letterform and there is no public access to the dinosaur’s email address in case he/she has one. Third, no instantaneous responses are provided and usually responding is done in letterform even when corresponding via emails. Finally, total delegation of mail management to the secretary. Apart from dealing with a very low and limited number of incoming mails due to effectively implementing the strategies described above, the dinosaur engages in total delegation of mail management such as checking mailbox for incoming mails, and dealing with them effectively.

But as far as professional activities are concerned, resisting digital technology is only partly possible for dinosaurs because these tools already play an important and dominant role at universities resulting in major changes of working conditions for scientists and researchers. For this reason rising group pressure negatively affects and impedes the dinosaur’s strategies of resisting the shift from traditional communication tools to online ones and makes them gradually collapse. In this respect even dinosaurs experience rising quantity of incoming mails, for example, starting a few years ago. Those dinosaurs that are still trying to escape group pressure are already aware of the fact that at work they would not be able to refuse integration of online tools any longer. Even if they manage to escape pressure at work, they finally have to give in due to private reasons, family and friends, who require them to adapt more to the tools provided by the Internet and the World Wide Web.

The only reason why some dinosaurs start to learn how to use and operate email communication with their secretaries’ support, for example, is the considered benefits derived from online data research. On the one hand they appreciate the opportunities for searching for scientific data using online tools and digital libraries, but on the other hand they regret the loss of face-to-face communication with library staff that enabled them to personally search in libraries’ repositories people normally have no access to.
Dinosaurs generally have an official website as part of the university website or their department. They are not interested in maintaining a personal website or weblog and they do not focus on publishing and promoting their scientific work on the web. The dinosaur only engages in traditional lectures. Some provide material and information for students on the net. Usually these parts are delegated to assistants, colleagues or other staff members. Dinosaurs do not visit websites or weblogs in search for online material and there is no membership in mailing lists or online journals.

As far as videoconferences, chats or different types of discussion forum are concerned they do not participate at all, neither professionally nor personally. Dinosaurs engage in traditional publications only and aim to continue publishing their works in printed versions. Some dinosaurs still write their works by hand and delegate the transcription of the manuscripts to secretaries or other people.

Finally, the dinosaur regards the Citation Index of low importance for a scientist’s reputation and thus does not use Citation software for checking citations.
### Attributes of the Dinosaur

- No web presence and (almost) totally resisting usage of online tools
- English-speaking non-native
- Most hold top position in scientific field
- Resists usage of online tools as much as possible
- Official website, not maintaining personal website or personal weblog
- Face-to-face communication and traditional letters basic medium for professional communication
- Developed effective strategies to avoid and resist email communication
- Total delegation of email management
- Traditional teaching only
- Traditional publishing only
- Citation Index ineffective measuring tool
- No usage of citation search engines
- No participation in videoconferences, chats and different types of discussion forum
- No online memberships
- No visits to websites and weblogs

No interference of online tools desired. Preserves traditional patterns and channels of communication. No intrinsic motivation to substitute effective and well functioning traditional communication tools by online tools.

Table 4.5.: Attributes of the Dinosaur
4. Communication Patterns and Types

4.3. Concluding Thought and Future Development

According to the explicit analysis and description of transformation processes and practices concerning usage respectively implementation of tools provided by the Internet and the World Wide Web we see very clearly that professors in academia belonging to the “older generation of academia” and having started to use online tools as “digital immigrants” have already become digitally literate to various extents. Online tools have shaped and impacted their practices, their habitus in the scientific field and thus new forms of communication types have been emerging which I explicitly defined and discussed in the previous section. I categorized these new forms of communication patterns into four groups of communication types — Enthusiast, Shifter, Laggard, Dinosaur — and showed that there is a bandwidth of types within each of the categories I defined.

As I have already argued in this chapter, different types of Internet users may theoretically exist but cannot be separated accurately like one may find in some studies on Internet usage. According to my study analysis, we cannot draw the conclusion that professors in the field of academia can strictly be defined as clear cut ideal types. There is no Enthusiast, Shifter, Laggard and Dinosaur as such but there are professors who use more of the described activities within one category compared to the other type.

My description of the attributes of the four groups of communication types shows very clearly that apart from differing practices using online tools all types share certain practices though in different degrees or due to individual experiences considering certain online tools as inadequate tools for certain professional activities and therefore resist using it for “good reasons” even when they have been among the early adopters of using computers in their professional environment. In this respect the following attributes are common ones, even for Dinosaurs:

- All of them use email communication
- All of them use the Internet for online data research
4. Communication Patterns and Types

• All study participants are present in the web by having an official website as part of their university or department websites

• All interview partners have an email address

• All interview partners provide online texts as PDFs as teaching material or online publications, for example

• All interview partners have started to acquire knowledge on operating computers and online tools

Drawing conclusions on the future development of my communication types it is already obvious that the Dinosaur type of communicators in academia will not exist anymore. The Dinosaur will be forced by group pressure from both colleagues and students in his/her professional environment to move into the group of Laggards. For this reason the group of Dinosaurs will totally be extinct in the near future since they are already facing huge problems and pressure for resisting usage of online tools in their fields.

As far as the group of Laggards is concerned I expect the development of new types of communicators but still remaining in this group as I defined it for the following reasons:

• All Laggards are still experiencing transitional stages concerning implementation of electronic communication tools and therefore they need to pass these stages first in order to be able to reflect and evaluate the usage as well as the benefit derived from these tools. Once they have successfully passed these transitional stages, they will individually decide whether to shift to the group of Shifters or resist online tools even more than they have so far.

• Some will continue lagging behind in operating online tools since technology is rapidly changing, constantly developing new electronic tools which means that time pressure will stay a critical factor for them in order to learn how to operate these new tools effectively into ones practices.

Additionally, I assume that some Laggards will move to the group of shifters as soon as they have successfully dealt with the problems of transitional stages using online
tools in their professional environment as well as developed effective strategies for
effective implementation of these tools.

Shifters like Laggards I suppose will show new forms of typical communication prac-
tices but still belong to their group because most of their behavior is characterized
through the defining group attributes. Some of them will develop towards the direc-
tion of the Enthusiasts. Mostly, I expect professors of the Natural Sciences or Social
Sciences to shift to the group of Enthusiats since they have been benefitting from
implementation of electronic tools into their professional activities more than those
from Humanities according to the results of my study. One of the reasons is that sci-
entists of Natural Sciences or Social Sciences tend to collaborate more with different
countries such as Third World Countries, South America or Africa, for example. As
far as developing countries are concerned, access to the Internet for these coun-
tries is more difficult than for developed countries and for this reason scientists be-
longing to Natural Sciences maintain websites to provide information on research
work done in those countries. Additionally, collaborations with students working on
projects can be more easily monitored in Natural Sciences than in the Humanities
where language itself is a major working tool in research. In Social Sciences and Nat-
ural Sciences experiments, figures and graphs are used more and language use is less
important.

In my interviews it turned out that — against my original assumption — asynchro-
nous asymmetric communication (e.g. communication between native and non-
native speakers via email) did not prove a major source for misunderstandings. Most
of the English-speaking non-natives of my study participants showed a very good
command of English due to Sabbatical leaves in English-speaking countries and in-
ternational collaborations for a long period of time.
5. References

5.1. Bibliography


5. References


5. References


5. References


5. References


5.2. Internet Addresses


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# A. Interview Codes

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<td>Personal History</td>
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<td>EB</td>
<td>Email Behavior</td>
</tr>
<tr>
<td>WW</td>
<td>Website &amp; Weblog</td>
</tr>
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<td>VC</td>
<td>Videoconference</td>
</tr>
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<td>CH</td>
<td>Chat</td>
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<td>DF</td>
<td>Discussion Forum</td>
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<td>SR</td>
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<td>PE</td>
<td>Personal Evaluation</td>
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<td>LS</td>
<td>Language Shift</td>
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### B. Legend for Grading System

**Table B.1.: Grading System**

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<td>Exists</td>
</tr>
<tr>
<td>N</td>
<td>Does <strong>not</strong> exist</td>
</tr>
<tr>
<td>R</td>
<td><strong>rare degree</strong> (not very often, from time to time, occasionally, sometimes)</td>
</tr>
<tr>
<td>A</td>
<td><strong>average degree</strong> (usually)</td>
</tr>
<tr>
<td>H</td>
<td><strong>high degree</strong> (very often, regularly)</td>
</tr>
<tr>
<td>–</td>
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</table>
C. Comparison of Interviews by Attributes (Subcategories)

Table C.1.: Comparison of Interviews by Attributes
(X=exists, H=high, A=average, R=rare, N=none, -= not mentioned)

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</table>

To be continued...
### C. Comparison of Interviews by Attributes (Subcategories)

| MC  | Attributes             | WI  | JA  | TD  | DM  | MD  | DR  | LD  | LG  | TP  | FJ  | SJ  | MH  | LS  | LK  | MU  | PA  | PP  |
|-----|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | Establishing contact   | -   | H   | -   | H   | H   | H   | H   | X   | H   | X   | X   | X   | X   | N   |     |     |
|     | Knowledge instruction tools | -   | N   | H   | -   | -   | -   | H   | -   | -   | X   | X   | X   | -   | N   | X   | N   |
| Basic medium | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   |     |     |
| Public access | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   |     |
| Number of emails a day | 30 | 50 | many | 30–35 | 75 | 50 | 40 | 20–50 | 40 | 60–70 | 40 | 45–60 | many | many | 100 | 50–100 | many | 2–3 |
| Spam filters | H   | X   | H   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   | X   |     |     |
| Personal management | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | N   |
| Filing management | H   | X   | H   | X   | X   | X   | X   | X   | X   | H   | -   | X   | X   | X   | X   | X   | N   |
| Piling management | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| Delegation | R   | N   | N   | N   | N   | N   | R   | X   | N   | X   | X   | N   | H   | X   | X   | X   | X   | H   |
| Frequency checking mailbox | H   | H   | H   | A   | H   | H   | -   | H   | A   | H   | H   | H   | H   | -   | H   | H   | N   |     |
| Mail reporting system | X   | X   | -   | N   | X   | X   | -   | N   | -   | X   | -   | X   | X   | X   | X   | X   | N   |     |
| Following Netiquette rules | N   | R   | N   | H   | X   | X   | R   | X   | X   | H   | -   | H   | H   | X   | -   | -   | -   |     |
| Time consuming | X   | H   | H   | H   | X   | -   | -   | -   | X   | X   | H   | X   | H   | X   | H   | X   | X   |     |
| Entertainment | X   | H   | N   | N   | -   | -   | -   | -   | -   | -   | -   | X   | -   | X   | -   | N   |     |
| Collaboration | H   | X   | H   | H   | H   | H   | H   | H   | -   | H   | X   | H   | X   | X   | X   | X   | N   |     |
| Personal website | X   | N   | N   | N   | N   | N   | X   | X   | X   | N   | X   | N   | X   | N   | N   | N   | N   |     |
| Personal weblog | N   | N   | N   | N   | N   | N   | X   | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   | N   |

*to be continued...*
### C. Comparison of Interviews by Attributes (Subcategories)

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*to be continued…*
### C. Comparison of Interviews by Attributes (Subcategories)

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*to be continued…*
### C. Comparison of Interviews by Attributes (Subcategories)

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### C. Comparison of Interviews by Attributes (Subcategories)

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Table completed
## D. Interview Analysis (Example)

### Table D.1.: Analysis Interview: Code FJ

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<th>Reduction</th>
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<tr>
<td>PH</td>
<td>1</td>
<td>I think in my case it’s something that I have used from almost in the beginning. Especially if I go back to the early 90s. I think the first thing was emails. What you call emails and being in contact with other researchers. Especially as a scientist I am being on several committees, grant selection committees in Canada.</td>
<td>Has used it almost from the beginning, especially from the early 90s using emails for being in contact with other scientists.</td>
<td>Early usage of emails for establishing and maintaining contacts with other scientists.</td>
<td>Usage of email for contacts and collaborations</td>
<td>Early adopter using emails for international collaborations 1, 2, 3, 4</td>
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*To be continued...*
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<tr>
<td>PH</td>
<td>2</td>
<td>It's something that has really revolutionized the way we can work. If you go back fifteen years the contact you had with other researchers was by ordinary mail. For grant committees and for organizing... ah... so to say... I organized a symposium I remember in the early 90s. That was the first time I really used the Internet because I had speakers coming from different places in Europe, the States and Canada. So I used it first to be in contact with them and to exchange the abstracts and then the presentations and publications that came from that.</td>
<td>In the early 90s started to really use the Internet to be in contact with speakers coming from different places in Europe, the United States, and Canada for two reasons: establishing contact, exchanging abstracts, presentations and publications.</td>
<td>Internet and the World Wide Web revolutionized the work of scientists.</td>
<td>Major change in working conditions</td>
<td>Shift from using emails to collaborating through direct access 2, 3, 4</td>
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<tbody>
<tr>
<td>PH</td>
<td>3</td>
<td>That was in the early days when it was still comparatively slow comparing to now. We had email but we didn’t really have the World Wide Web as a tool at that stage or it wasn’t really developed enough. What we did and if I think back to grant committees everything would be sent by mail and that would take several days and then everything would be sent back by mail. And every new directive from the government organization doing the grants had to come by fax or email so where now all of this is done by another grant committee, everything is online. We just go straight onto the site and we have direct access to the documents that are being put there and much of it is not even printed now.</td>
<td>In the old days technology was slow and restricted to email communication. Concerning grant committees, for example, everything was sent via email. Every new directive from the government organization doing the grants had to be received by fax or email whereas now everything is online. Researchers have direct access.</td>
<td>Shifting from using faxes and email to enabling access to data and information on websites</td>
<td>Shift to accessing data online</td>
<td>Experiencing major change in working conditions due to digital tools provided by the World Wide Web and the Internet 2, 3, 4</td>
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<td>Generalization</td>
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<tr>
<td>PH</td>
<td>4</td>
<td>I guess it’s by the World Wide Web but you actually don’t print anything anymore. Everything I do is by computer. And I think some of that is because of changes in computers but it also is because of the World Wide Web we have this direct access with our collaborators etc. throughout the world.</td>
<td>Due to the World Wide Web there is almost no printing anymore. He does everything by computer. It is not only because of better computers but also because of the World Wide Web that they have direct access with their collaborators.</td>
<td>The World Wide Web enables international collaborations for researchers due to direct access</td>
<td>Collaborating through direct access</td>
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<td>EB</td>
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<td>I probably have about somewhere of 40 coming in a day.</td>
<td>Probably about 40 mails per day</td>
<td>Number per day: 40</td>
<td>Number of emails per day</td>
<td>Email used as basic medium for professional and personal communication 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</td>
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<td>EB</td>
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<td>It’s very difficult to manage. I use Outlook. The university has a centralized system. We have a very good system for I guess getting rid of the junk mail. We have a very good filter for that through the university.</td>
<td>Difficult to manage mails. University uses a centralized system and good filters for getting rid of spams.</td>
<td>Usage of spam filters</td>
<td>Spam filters</td>
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To be continued…
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</thead>
<tbody>
<tr>
<td>7</td>
<td>7</td>
<td>What I do now is I flag. I go through first thing in the morning. I turn my computer on and do that at home before I go to work and I go through what has come in. I flag the ones I need to do something about. The rest I read. And then basically I leave them there. The ones I really know that really have nothing to do with me I flush right away. The ones I may want to come back to I leave there. Then about once a month because it gets close to my maximum in my inbox I put them down into my private box on my computer. And I always have both. I have an Outlook setup. When an email comes in, it stays central and it also goes on my computer.</td>
<td>Checks his mails first thing in the morning at home and flags those he needs to do something about. He reads the rest and leaves them there. Deletes the ones he knows have nothing to do with him. The ones he may want to come back he leaves there. Once a month transfer into his private box on his PC. He always has both. Has an Outlook setup and when an email comes in, it stays central and it also goes on his computer.</td>
<td>Personal mail management using flagging and filing. Usage of Outlook setup.</td>
<td>Personal management Filing</td>
<td>Mainly personal management 7, 12, 13 Delegation to assistants 16 Used for collaborations 8, 9, 11 Following strict Netiquette rules when composing emails important 15</td>
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<tr>
<td>8</td>
<td></td>
<td>I do a lot of traveling for and with collaborations I have done and give talks in different countries. Being reasonable mobile I need to have access to my emails as I travel. And that’s another thing that has really changed. Now basically you can be anywhere in the world and if I go away for two or three weeks, I can work in another place basically as long as you have access to high speed email, high speed Internet. Basically for me I mean it is my workplace. So I can be in contact with my lab. And I have about ten students and researchers and technicians etc. in my lab. So that is always working. So when I go away, I can be in constant contact by email and I guess the next thing is … I’ve just gone on to using Skype and using Skype with the webcam. That’s gonna be the next I think…ah…I think the type of interview we are doing now is the sort of thing I can see is really going to revolutionize the way I work my research.</td>
<td>Needs to have permanent access to his mails for doing a lot of traveling due to international collaborations, giving talks in different countries. High speed Internet is essential as constant contact with his lab consisting of about ten students, researchers and technicians and it is always working. Just started using Skype with webcam. Conducting videoconferences will revolutionize the way he does his research work.</td>
<td>Internationally collaborating researchers need constant access to the Internet</td>
<td>Permanent access Collaboration</td>
<td>Frequent usage of Internet Cafés when abroad 8</td>
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<td>9</td>
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<td>So quite often when I travel I use the Outlook Express by going on to Internet and going through there. If you look back at the history of that, if you go back ten years when the university was, when everyone was first getting used to using it, it was still too heavy to be able to travel with. In those days I would go with, I had Hot Mail. When I travel, I use Hot Mail. When traveling quite often, I go to an Internet Café. In fact I use that probably more and more. (only expensive hotels provide high speed Internet) So I use a lot of Internet Cafés. You go in there and you hook up to Internet. I use the Internet Doctor for downloading it on to my computer.</td>
<td>Frequent usage of Outlook Express when traveling. In the past computers were still too heavy to be able to travel with. In those days he only used Hot Mail. When traveling usage of Hot Mails and frequent usage of Internet Cafés. Usage of Internet Doctor for downloading mails on his computer.</td>
<td>Hot Mail and Internet Cafés enable constant contact for traveling researchers.</td>
<td></td>
<td>Internet Café Collaboration</td>
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| 10 |   | I am already an email person.                                                                                                                                                                               | Already an email person                                                                                                           | Shift to email person                                                                                       |           | Email person | to be continued…
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<tbody>
<tr>
<td>11</td>
<td>The other thing talking about using Internet and email is that a lot of the exchange I have with my students, technicians is by email. Not reducing at all the personal contact. That’s one of the big problems with email because people away from office will converse by email rather than by talking. I think talking is still very important. What I’ve tried to do over the years is to put the whole electronic thing and informal thing into respective with all the tools we have. I think still one of the most important tools we as scientists have with our students is face-to-face contact.</td>
<td>Most collaborative work with students or technicians done via emails. Though online communication facilitates work, face-to-face meetings still important. Has always tried to put digital communication tools in respective with traditional ones. Considers face-to-face contact still one of the most important tools scientists have with their students.</td>
<td>Collaborative work in research needs both online and face-to-face communication.</td>
<td>Collaboration Face-to-face meetings</td>
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D. Interview Analysis (Example)
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<td>12</td>
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<td>But quite often what I do is I spread up my day. I work a little bit in the morning at home and I work at night at home. So quite often I look at my emails there and I answer. The students will send questions or they have queries or whatever. I can do that last at night or in the morning before going on.</td>
<td>Spreads up his day in small email units. Works a little bit at home in the morning and in the evening. Quite often checking and instant dealing with emails there.</td>
<td>Instant personal dealing with emails</td>
<td>Personal management</td>
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<td>13</td>
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<td>Probably about I guess ten times. What happens I just use my portable and at work as well.</td>
<td>Probably checking his mailbox about ten times a day for permanently using his portable.</td>
<td>Portable computers allow frequently checking mail box</td>
<td>(High) frequency checking mailbox</td>
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<td>Yes. So basically I don’t turn out to be an email freak. If something comes in and I see it is not urgent, I don’t go and check it straight away. At least, I know, if something urgent comes in, I can just go onto it and try and do something about it straight away. What I tend to do is if I look at it, I put them … ah… I am not someone who has to answer something straight away because I think what a lot of people do is to have the feeling because you get it instantaneously you have to answer instantaneously. When it comes in and if I evaluate it first urgency, then I’ll get back with respect to my own evaluation of urgency and not to the urgency of the person that sent it to me. Otherwise I would become slave to the whole thing.</td>
<td>Usage of mail reporting system, but has not turned into an email freak. Would not check incoming mails that are not urging right away. Tendency to follow his personal indicators of urgency when dealing with mails in order to avoid becoming a slave of email communication.</td>
<td>Using mail reporting system whereas personal evaluation of urgency on dealing with mails reduces time pressure.</td>
<td>Personal mail management Mail reporting system</td>
<td>to be continued…</td>
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<td>15</td>
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<td>I was brought up in a time when writing and letter writing was an important tool. What you say to someone is temporary but what you write down is permanent. When I write, I guess you can call that Netiquette if you like, what I do is I write it, I think about it and then I correct everything and I sent it out. I don't use Netline. I always make sure that things are expressed properly so it's gonna be understood the same way by the person who reads it. I don't use capitals for ... I don't use all these manners and things like capitals like for saying something by auto or whatever. For me it's a letter and I always try not to just send little lines, I always use a type of politeness in saying Dear Someone depending on which language you are writing in and always something at the end, no, not perhaps as much as in the old days with letters. But I don't want it to be something that has to be a buffering there. You just cannot write something down and send it off. Two words and send it off. I mean you have to think about it.</td>
<td>No usage of Netline but following Netiquette rules. When he writes, he reflects on it, corrects everything and then sends it. Makes sure everything is expressed properly. No usage of abbreviations to say something automatically. Usage of politeness starting and finishing mails and critically reflecting on content.</td>
<td>Shift from letter writing to email correspondence impact on using Netiquette rules when composing emails.</td>
<td>Following Netiquette rules important</td>
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<td></td>
<td>16</td>
<td>Some go to my assistants, yes. We have enquiries coming from worldwide for that and we have to set up agreements and everything like that. When that comes in, that goes to one of the assistants. For reprints or anything to do with the website I have another assistant for that. The way I work is that some of these will go directly to the assistants and will re-contact the person directly always with me in CC. Or I will unless it’s just something I aah...it might be sending back an article or something like that. That doesn’t need to be me in contact with the person. But if it is something, for instance, they want to set up a collaboration and quite often what will happen is that there will be an initial communication with me and some will do all of the discussing and all the things together and then I say I put you in copy with my assistant in CC and she will do it then. She will take her from there and so the person at the other end is aware what’s going on and it keeps a personal part aside to it as we got not to forget all that in our electronic world.</td>
<td>Delegating mails to assistants. One deals with setting up agreements on enquiries coming in worldwide. Another deals with reprints or website matters. Those mails would go directly to assistants who re-contact the person directly always in CC with him. For setting up a collaboration the initial communication is done with him.</td>
<td>Delegation of emails on certain issues to assistants.</td>
<td>to be continued...</td>
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<td>WW</td>
<td>17</td>
<td>A personal website, I have never felt a need for it.</td>
<td>No need for keeping personal website.</td>
<td>Official website only</td>
<td>Official website only</td>
<td>Publishing and promoting research work on official website 17, 20</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>No need for weblog 18</td>
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<td></td>
<td>18</td>
<td>Weblogging I guess I have never got into it. There is no reason. It's enough for me I guess. I've never felt a need for weblogging. I looked at yours and I was looking what you are doing and I think probably there are circumstances where it seems to be very useful.</td>
<td>No reason for keeping a personal website.</td>
<td>No need for weblog</td>
<td>No personal weblog</td>
<td>No need for weblog 18</td>
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<td>That has revolutionized the way... when I am writing a chapter, I can do that from sitting here. In the old days you'd have to go to the library... and this took weeks waiting for it. Whereas now when I start to work, I start with PubMed. Because for us that's the most important one for biology sciences. There I'll get the maximum of articles. I put in the words I want. I get the articles I want. I work from those and then go on to other articles. If there is a website, I go to that website and get some more information. On the scientific side it tends to be more through articles. When you want to know a little bit more of the applied side like for instance whose making such and such a vaccine or what's being done for the importance of a disease in a certain country... In order to do that I go on to websites that could be government websites, websites for companies that could be websites for other researchers. Basically I spend a couple of hours just from going from one website to another. You start at A, you start with one thing and then you just go from there onto another, you just follow a line all the way. Two hours later you have got all the information you need.</td>
<td>Frequently visiting subject related websites and blogs for his research work. Now searching data from home or office whereas in the old days physically going to the library. This was very time consuming. Now searching PubMed or other websites. On the scientific side it tends to be more articles. On the applied side visiting websites to gather certain data from.</td>
<td>(High) frequency of visiting websites and blogs</td>
<td>Data research</td>
<td>High frequency of visiting subject related websites for data research 19, 21</td>
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D. Interview Analysis (Example)
20

I am setting up a network of labs throughout the world. The website is going to become a resource especially for developing countries. For us living in developed countries we think everybody has it but when you are in contact with people in developing countries and you realize that well, they don’t have high speed, they don’t necessarily have this, they don’t have access to the journals like we do both to look at and also to publish. You go somewhere like Africa where there is all the communication we have, just to go from one African country to another to get information from country to country is still very, very backward. And so what I want to do with the website is to be able to provide information on disease in animals, is to have this resource web where people can submit… ah… we can have information, they are coming from different… what’s happening with a disease, why is it in different countries. And so you have from one country information, from a country next door that has no direct access for them we’ll be able to come in and use, just to see that. So we will be able to get this web, this network going.
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<td>21</td>
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<td>All the tools with Google, I use Google a lot, and then I have Google Scholar now. I have used it a little bit, but I still get to PubMed, and I use CABI or Cab International (Commonwealth Agricultural Bureaux) &lt;<a href="http://www.cabi.org/">http://www.cabi.org/</a> &gt;. It is a data bank of publications in the agricultural field, which is more comprehensive than PubMed for publications originating from developing countries, which are often not peer-reviewed. One of the other motors for getting scientific papers. And what I think again I am using a lot more is a reference lab.</td>
<td>Frequent usage of Google and Google Scholar for searching material. Moreover, he uses PubMed or CABI, a data bank of publications for getting scientific papers.</td>
<td>Online data research on scientific papers</td>
<td>Data research</td>
<td>to be continued...</td>
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<td>VC</td>
<td>22</td>
<td>I have just started with my brother in Australia to correspond by Skype by the same way we are doing it right now. Skype until now I have mostly used it personally for my family is all in B. And I use it when I travel. I have started using it during the last twelve months. I have now seen the advantage of using it for work as well. So I think I will get a webcam for my lab and I think next time when I travel we’ll be able to talk as we are talking now. But of course there is still one small problem when traveling and that is that not everybody has high speed especially when you are going to places like Vietnam.</td>
<td>Recently started to engage in private videoconferences using Skype. Has started using it during the last twelve months when traveling. Due to the advantages using videoconferences by Skype he will use it for future collaborations with his lab as well. But there still exist technical problems in developing countries such as Vietnam.</td>
<td>Private participation using Skype. Future implementation of digital tools for conducting videoconferences planned.</td>
<td>Low professional participation Private participation using Skype Technology resources at department average importance 22, 24 Private chats only 23</td>
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<td>23</td>
<td>Chats no. I am not really involved in chats or anything like that.</td>
<td>No professional involvement in chats, or different types of discussion forum.</td>
<td>No professional participation in chats, discussion forums.</td>
<td>No professional participation in chats</td>
<td>to be continued…</td>
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But videoconferences, when necessary. I wouldn't say regularly like every week or whatever but we do use it. For example, I was on a committee for the comprehensive example for a PhD student. And her major professor was back in B. So we did the exam here and the person in B. was set up by videoconference. So that would be an example. I had been on committees for graduate students elsewhere in Canada. So when we did the meetings we did them by…our vet school has a videoconference system work set up. It would be maybe once per one to two months that we would do that.

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<td>24</td>
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<td>But videoconferences, when necessary. I wouldn't say regularly like every week or whatever but we do use it. For example, I was on a committee for the comprehensive example for a PhD student. And her major professor was back in B. So we did the exam here and the person in B. was set up by videoconference. So that would be an example. I had been on committees for graduate students elsewhere in Canada. So when we did the meetings we did them by…our vet school has a videoconference system work set up. It would be maybe once per one to two months that we would do that.</td>
<td>Professionally engaging in videoconferences for the following reasons: committee member for a PhD student whose major professor was in B. and the exam was done via videoconference; member of committees for graduate students elsewhere in Canada and the meetings were held as videoconferences once per one to two months.</td>
<td>Usage of videoconferences for conducting final exams of PhD students from abroad and committee meetings for graduate students from other parts in Canada.</td>
<td>Average frequency of professional participation in videoconferences</td>
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<td><strong>OB</strong></td>
<td>25</td>
<td>Online journal, yes, the American Society of Microbiology. Mailing lists I have tried to avoid. Because I just find that you are flooded with all this stuff, which you don’t really need.</td>
<td>Membership of online journals such as the American Society of Microbiology. Trying to avoid mailing lists for they cause floods of information one does not really need.</td>
<td>Membership of online journals more importance for research than mailing lists as they cause an overload of information not really relevant</td>
<td>Membership of online journals</td>
<td>Avoidance of membership in mailing lists due to increase in quantity of mails 25</td>
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<td><strong>OT</strong></td>
<td>26</td>
<td>No I don’t. My teaching load is not very high because I am a researcher. So twenty percent my time is teaching. It’s mostly graduate students and so it is teaching one on one.</td>
<td>No online teaching. As a researcher teaching load rather low and mostly graduate students teaching face-to-face.</td>
<td>Teaching still traditional lectures.</td>
<td>Traditional teaching only</td>
<td>Traditional lectures predominant 26, 27</td>
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<td>27</td>
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<td>But I follow a WebCT course to see what’s it about and I think there is a lot of… ah… I think there is a lot of future in a lot of type of courses. In an infectious disease course I am involved in with the undergraduate students, it’s a tutorial type course so we work in groups but for this everything goes on to the web. Students have our course …. it’s a problem based learning we use. They have the problems, they have everything at their hands that goes through the web. But the actual teaching part of this is face-to-face.</td>
<td>Following a WebCT course to gain experience with this type of courses he considers will gain importance in the future. Involved in a tutorial type of course on problem-based learning with undergraduate students. Problems, information and material provided by the web, the teaching part is done face-to-face.</td>
<td>WebCT courses for instruction</td>
<td>Traditional teaching</td>
<td>Usage of web for synchronous distance collaboration</td>
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27, 28, 29

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<td>28</td>
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<td>Teaching for me is mostly with graduate students and students. We have students collaborations elsewhere in the world and we have students involved there. So there is a big teaching element there and that’s one area where we are really using the web a lot. For instance, I just had a PhD student coming from Australia. He was here for three months now. The way it will work, he will come. They’ll do a lab part here and so we have face-to-face communication. Before and after he goes back the collaboration continues and all the work would be done in the other lab. And because of the Internet now they’ll do a particular experiment. They will take photos and then you can scan that and set up directly back and so basically on the same day I can see what they have done in the lab there. So basically we are working at distance and there is a big research element in that that has revolutionized the web now. We can do a part of the work here and a part of the work there. In Australia we do a part, in Asia and, you know, it’s all almost simultaneous what we are doing. What’s the word ah…real time.</td>
<td>Teaching mostly graduate students. Web important for student collaboration elsewhere. Australian PhD student did lab part in face-to-face in Quebec. Before and after collaboration continues, all work done in another lab. They will take photos and then you can scan that and set up directly back and so basically on the same day he can see what they have done in the lab there. Internet enables synchronous distance collaborations.</td>
<td>Simultaneous distance collaborations with students enabled through the World Wide Web and the Internet. Parts of the work can be done in one country and then students would go back to their country continuing their lab work and collaborate with their professors elsewhere by using tools.</td>
<td>Synchronous distance collaborations</td>
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<td>29</td>
<td>Also, there is a big teaching element in that because … ah … you talking about teaching at the distance, basically for me that’s my teaching at the distance. These are students and I might be involved in their thesis or writing of the papers, or whatever so this is something we couldn’t have done ten years ago. That I think is really one part that has totally revolutionized. And that for me is both work and research and teaching part as well.</td>
<td>These collaborations with students basically would be his teaching at distance for him. He might be involved in writing papers or in the thesis of students. Digital tools have strongly affected his work, his research and part of his teaching.</td>
<td>Predominance of traditional teaching, but digital tools are already impact factors</td>
<td>Synchronous distance collaborations</td>
<td>Impact on research and teaching</td>
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*to be continued…*
<p>| MC | # | Data Extracts                                                                 | Paraphrases                                                                                                                                                                                                                                                                                                                                                           | Generalization                                                                                                                                                                                                 | Reduction                                                                                                                                                                                                 | Description                                                                                     |
|----|---|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DP | 30 | Publishing we do basically everything electronically now. As I said for reading I don’t print anything anymore, I get it directly from the journals. For publishing, most of the journals we publish in now offer the rapid electronic submission and that’s where we go. | Now all publications are basically done electronically for most of the journals they publish in offer rapid electronic submission. Concerning his readings he would not print articles, he directly accesses them online from the journals.                                                                 | Total shift from traditional publications to online publications                                                                                                                                                                                                       | Total shift to online publications 30                                                                                                                                                                                                                           | Online reviewing 31                                                                           |
| 31 | The last ten years I guess it has evolved. In the beginning you could submit parts of it, but other parts, for instance, photos which were too large. As it’s evolved now basically we do everything by the net. Reviewing them as well. When I must review papers, it’s just so revolutionized now. It’s gone from getting the paper, write on the paper everything by hand. Now everything I do totally electronically. | Concerning reviewing papers he does it electronically.                                                                                                                                                                                                                                                                                                                | Shifting to online reviewing                                                                                                                                                                                                                                         | Online reviewing                                                                                                                                          |                                                                                                                                                                                                                                                                   |</p>
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<td>SR</td>
<td>32</td>
<td>No, not really. I have never been a believer in counting publications.</td>
<td>Not really using programs in search for citations for he has never been a believer in counting publications.</td>
<td>Almost no usage of programs to search for citations</td>
<td>Hardly checking Citation Index</td>
<td>Citation Index low importance for scientific reputation 32, 33, 34, 35</td>
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<td></td>
<td>33</td>
<td>When we are looking at grants now or proposals, it’s all based on how many people are reading your papers and that. I don’t put too much emphasis on it. I know that’s easy to say oh I have had 300 citations, so that my article is more important because another one said fifty. But then you have to look at the one who might have said fifty. Maybe it is a type of work where only fifty people have been important. I always look at it like that. I just noticed on Google Scholar.</td>
<td>Concerning grants or proposals all is based on how many people are reading your papers. He does not regard the number of citations as a highly effective measuring tool for a researcher’s reputation.</td>
<td>Citation Indexes do not appropriately measure a researcher’s reputation</td>
<td>Citation Index no appropriate measuring tool</td>
<td>Digital publications impact on a researcher’s international reputation 34</td>
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<td>34</td>
<td>My reputation, I guess it puts you on a worldwide level. A lot more people know what you are doing. Whether it’s a good thing or a bad thing I don’t know. My reputation if you like is also linked to the … as much or maybe even more than with my scientific articles. It’s with the website and with the information that we are getting out to people in general on how we’d call in general on animals. So I think if you put the website and the publications together then it’s affected, I think it’s much more wide now.</td>
<td>Digital publications make you internationally known no matter what quality the publications are. His reputation as a scientist has probably increased due to both website and scientific articles.</td>
<td>Digital publications increase reputation worldwide</td>
<td>Digital publications impact on reputation</td>
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<td>35</td>
<td>I used Google Scholar for the first time last week and I looked at my articles and I have citations and whatever. So it’s the first time I looked at it.</td>
<td>Usage of Google Scholar just recently for the first time to check his articles and citations</td>
<td>Usage of citation software less important</td>
<td>Citation software</td>
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<td>PE</td>
<td>36</td>
<td>I haven’t really got into YouTube. No, not because I am against it. It’s just because I haven’t got time to. Sometimes I would get there for a particular reason.</td>
<td>Rarely checking YouTube videos.</td>
<td>Rarely checking YouTube videos.</td>
<td>Rarely checking YouTube videos.</td>
<td>Rarely checking YouTube videos 36</td>
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</thead>
<tbody>
<tr>
<td>LS</td>
<td>37</td>
<td>I am originally from B. I left in the late 70s</td>
<td>English-speaking native</td>
<td>English speaking native</td>
<td>English speaking native</td>
<td>Both languages used for professional communication but usage of English predominant 37, 38, 39, 40</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>I am at a French University, where most of my colleagues are French-speaking and so when we are conversing, I would converse in English, I write in English and I write in French.</td>
<td>Working at a French university and most colleagues are French-speaking. He uses both languages</td>
<td>Both languages used</td>
<td>Both languages used</td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>#</td>
<td>Data Extracts</td>
<td>Paraphrases</td>
<td>Generalization</td>
<td>Reduction</td>
<td>Description</td>
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<td></td>
<td>39</td>
<td>I have people who I collaborate with very closely and they are French-speaking. I will…ah…once we have established that this is the way we work they will write in French and I’ll write in French. It’s going for either in France or in Quebec. But for anyone else I use English. Most emails come to me in English, so I reply in English. If it is someone who I don’t know well, if it is a French speaking one that comes to me, I will probably reply in French unless I know the person really well.</td>
<td>Using French for collaborations in France or Quebec. For international collaborations he uses English. Email communication is mostly done in English.</td>
<td>Both languages used for professional communication but usage of English predominant.</td>
<td>Both languages used</td>
<td></td>
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</table>

...to be continued...
<table>
<thead>
<tr>
<th>MC</th>
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<th>Reduction</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>40</td>
<td></td>
<td>It's more in English I think. The way it works is, when it is a presentation in Quebec, it will be in French, especially when it is the students. A lot of the publications I do with my students. If it is something, for example, a grant proposal which was done in the province of Quebec that will all be done in French. And the reports coming on that will be in French. But the language most common, I think, would be English. Because basically in French not many people are going to read it. Whereas when it is in English, the audience is much wider. (the audience is going to be international)</td>
<td>Publications done in both languages. Again usage of English predominant. Presentations in Quebec and for students are in French, publications with students are in French, grant proposals or reports done in the province of Quebec are in French. But English is the language most commonly used for the audience is wider with English than with French.</td>
<td>Both languages used for publications. Publications in English increase international public. Local professional communication in French. Predominance of English for professional communication outside Quebec and worldwide.</td>
<td>Both languages used</td>
<td></td>
</tr>
</tbody>
</table>
Erklärung


Krems, im Juli 2010

Ingrid Bergner