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# The Digital Divide - Any Reasons for enthusiasm? The Case of Austria

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# The Digital Divide - Any Reasons for enthusiasm? The Case of Austria

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## Abstract

*The paper presents a secondary analysis of the Austrian data of a Eurobarometer (conducted in all member states of the EU) data set and addresses questions of penetration and usage of new information and communication technologies. Before going into the empirical analysis we provide a brief theoretical analysis of the digital divide concept, based on a literature overview. Up to now, research on digital divide analyzed predictors of this phenomenon only separately without considering interaction effects. Our analysis aims to develop various types of Users and Non-Users by combining demographics and information about internet usage in a cluster analysis. Results give strong support to consider Users and Non-Users not as homogenous groups in future research. A more differentiated view has to be applied: combinations of attributes can yield in deprivation in a double or even tripel sense, so that some groups are harder to reach by ICT-policies than others.*

**Keywords:** digital divide, statistical analysis, Austria

## 1 The digital divide: defining a "fuzzy" term

The problem of the digital divide is so important in our days because regularly the access to and the competency of using modern ICTs is regarded as a road out of poverty for poor communities (and whole countries as well). As ICTs are seen as entrance tickets to the prospering information society the simplest concept of the digital divide is having access to a telecommunications infrastructure or not having it (Molina 2003).

## 1.1 Social inequity versus market place reasoning

Especially in countries with conservative governments like the USA under the bush administration the term digital divide has been put on the sidelines. The former FCC (www.fcc.gov) Chairman Powell has tried to explain the digital divide as a normal phenomenon of the American way. His argument was that as there is no "Mercedes divide" there is also no digital divide, some people can afford technology some can't (Strover 2003). So the digital divide can be seen as "*modern day reflection of historical, social, and economic divides that have plagued our society for years*" (Pinkett 2003). The idea that the digital divide may lead to or may enforce existing social problems was additionally challenged by statistics, reporting increasing numbers of computers and growing internet use. So obviously everything was moving in the proper direction. Seeing things that way has led to the shutting down of many programs funded by the federal government in the USA, e.g. Department of Education's Communities Technology Centers Program (Strover 2003). Relying just on the market forces seems to be the new paradigm in the fight against the digital divide at least in the USA. Following this simple view we may define the digital divide as partitioning the world into ICTs "Haves" and "Have-nots" (Goodman et al. 2001). If the whole digital divide "problem" is reduced to a matter of having access to the proper technology or not having it, i.e. to the simplest way of analysing that complex social phenomenon, pure market based actions (e.g. providing cheap technology due to competition between suppliers) may appear as suitable solutions, but there is also a different view to see it, very clearly expressed for instance by Molina (2003): "*The digital divide can be understood as a predominantly quantitative gap in access to ICTs, or, as an intrinsic element of the much wider and deeper problem of exclusion and relative poverty with all their manifestations*".

Probably the most addressed aspect of the digital divide is the technology gap between developed and less or undeveloped nations, a lot of research has been done in that area and the majority pays attention to the qualitative aspect of the digital divide too (e.g. Warschauer 2003, Guillén and Suárez 2005). Focusing on national differences alone wont show the phenomenon in its full complexity, because if we look at the "haves", i.e. rich/developed nations like the USA and the EU countries, we find great differences of ICTs use within those countries too, based for instance on age (Lam and Lee 2006), region (Kvasny and Keil 2006), and the circumstances in rural contrasted to urban environments (Labrianidis and Kalogeressis 2006, Mills and Whitacre 2003). These are just a few and of course not all possible partitioning reasons.

We believe that the digital divide is not only about having (theoretically) access to the technologies but also about the ability and the need of using them in a proper and efficient way. Therefore Wilsons's definition seems very useful to us: The digital divide is "*a substantial asymmetry in the distribution and effective use of information and communication resources between two or more populations*" (Wilson 2000).

## 1.2 Former research

Much research work has been done in the field of digital divide during the last 15 years. There is a long tradition in analyzing new information and communication technologies in the United States (NTIA: Falling through the net series) and there are also regular surveys in Europe addressing questions on digital divide using the

Eurobarometer Series. Core research questions concerning ICT-penetration and -usage in households focus on the following topics (Norris 2001, van Dijk et.al. 2003, Di Maggio et.al.2003, Gehrke 2004, Katz 2002):

*Penetration and Usage*

- Penetration and usage of information- and communication technologies
- Effects of sociostructrual variables like age, sex, education, occupation, ethnicity and income on ICT usage
- Regional disparities in ICT penetration and usage
- Effects of sociodemographic variables vs. effects of attitudinal components on ICT usage
- Barriers in using ICTs

*Consequences of ICT*

- Knowledge Gaps
- Consequences on participation and quality of life
- Inequalities in distribution of human capital and social capital
- Possibilities to meet growing demands from e-government for different groups of citizens
- Possibilities to participate in e-commerce activities

*Action programs against Digital Divide*

- Programs focusing on main groups like the elderly, pupils, women and handicapped persons

# 2 Research questions

Especially the last area of research can be seen as a starting point for the following analyses and gives hints about shortcomings of current research. Up to now, most research in the field of digital divide focused on single attributes of Users and Non-users without combining them to substantially meaningful groups. Users and Non-users are seen as quite homogenous groups by now. The "problem groups" seem to be clear: *the* elderly, *the* female inhabitants, *the* lower educated respondents and so on.

Selhofers and Hüsings (2002) analysis is a good example for this unidimensional approach. Their paper aims to develop a new index on digital divide (DDIX) by combining four variables on computer and internet access. The DDIX became a very prominent measure on digital divide, because of its easy computation, the existence of comparative data for Europe in two points of time and its presentivness. The authors computed the index value for four deprived groups: women, elder persons (above 50 years), persons with low education (no education degree at all, compulsory education only) and persons with low income. The final measure represents the arithmetic average on four indicators for each group compared with the whole sample. The range of the DDIX is "0" for "no internet usage" and "100" for "equivalent internet usage" comparing the deprived groups to the total population.

| *Independent variable* | *Definition of the disadvantaged group ("risk group")* | *Percentage of population in EU (2000)* |
|---|---|---|
| Gender | Women | ~ 52% |
| Age | People aged 50 years or older | ~ 40% |
| Education | Low education group (people who finished formal school eduaction at an age of 15 years or below) | ~ 30% |
| Income | Low income group (=the lowest quartile of the survey respondents) | ~ 25% |

**Figure 1: Classical "risk groups" in digital divide research – the DDIX (source: Selhofer and Hüsing 2002)**

The problem with the definition of the four risk groups is obvious and even acknowledge by the authors (Selhofer and Hüsing 2002) themselves: "*We acknowledge that the methodology applied to calculate the DDIX will need some revisions. (...) The four risk groups are not mutually exclusive*." To overcome these shortcomings, we use cluster analysis to allow interdependencies among different groups of Users and Non-Users. In other words: can one describe groups of users and non-users by various attributes so that action programs can focus more accurately on their target groups? Our research objective in this paper focuses on the development of such groups of users and non-users and discusses the consequences of addressing these groups by various policies. The following research questions are going to be addressed:

- who are the users and the non-users comparing various sociostructural variables
- which groups can be formed in combining sociostructural variables and internet usage
- which role does computer literacy play in being interested in internet usage
- which contents are interesting for which groups
- who sees the most barriers when it comes to internet usage

During the past 10 years large enthusiasm, mostly politically driven, can be observed concerning the "closing" of the digital divide. In comparing measures which are based mainly on internet access instead of a detailed analysis of usage and usage frequency, authors are suggesting a decline in digital inequality because of increasing growth rates in the "problem groups". But if you start from "zero", obviously one can expect such high percentages of growing compared to the innovative users and internet starters, where nearly saturation in internet usage can be diagnosed. As van Dijk et.al. (2003) argue, these attempts to "play down" the digital divide may result because of the political influence on the research discussion: "*In turn the question is whether it will close or widen in future years. Much of this discussion is politically charged*." Beyond these measurement shortcomings, current research is discussing a second order digital divide (differences in computer and internet literacy and in hardware and software equipment) while there are still some specific groups of the population which are totally excluded from any kind of primary access. Although it seems necessary to

overcome shortcomings in measurement of the "dependent variable" "internet access", there is still much work to be done in analyzing the "independent variables" such as demographic characteristics and interdependencies among them. Our analysis show that often these excluded groups are deprived in a double or even triple sense: unemployed persons, persons with low mobility and low income and low education, who are not currently using the internet and its opportunities. In this sense we can't agree with the enthusiast's views as described by Di Maggio (et.al.) (2001): "*Enthusiasts predicted that the internet would reduce inequality by lowering the cost of information and thus enhancing the ability of low-income men and women to gain human capital, find and compete for good jobs, and otherwise enhance their life chances*." Still there are groups excluded from access and usage of the internet, and there are hints that especially these groups are not interested in using the internet for their personal forthcomings.

# 3 Methodology

The secondary analysis of the Eurobarometer 59.2. (survey period 2003) gives in-depth results on the topic of digital divide in Austria. Our analysis focuses not only on questions of internet penetration on a general level like other surveys and reports on the Austrian situation (Austrian Internet Monitor, "IKT-Nutzung in österreichischen Haushalten" conducted by the national statistics agency) but gives detailed information about the groups of users and non-users considering their demographic characteristics and combinations of these variables. The survey addressed 1.019 respondents in Austria and is part of a large European Survey Program, namely the "Eurobarometer", conducted several times a year including various topics. The Austrian survey was conducted by "Spectra" a national market and opinion research institute in charge of the European Commission.
The questionnaire covered several topics from immigration and xenophobia to transport and consumer protection and of course usage of Internet access, usage, and expectations. Questions on ICT give information about frequency and intensity of usage, reasons for usage and non-usage and contents of the internet, which could be interesting for respondents.

## 3.1 Sample description and descriptive results

The survey covers slightly more female than male respondents. Compared to the national census of population (Austrian national census of population 2001), the age groups 15-25 years and 65 years and older are slightly overrepresented.

| Gender | % | Age | % | years in education | % |
|---|---|---|---|---|---|
| male | 43,6 | 15 - 25 years | 15,3 | up to 15 years | 34,1 |
| female | 56,4 | 26 - 44 years | 35,4 | 16 - 19 years | 43,1 |
| | | 45 - 64years | 31,2 | 20 years + | 15,9 |
| | | 65 years + | 18,1 | still studying | 7,0 |

**Table 1: Sample description**

About half of the respondents use a PC, 38% use the internet and every fifth person can use the internet at home. The most frequent activity among the internet

users in Austria is news reading and news consuming. Social activities like having contact with friends and family are also among the favourite activities. Concerning the contents of interest, internet users which are typically younger persons are interested in searching for education and learning materials on the web. Activities like e-commerce (28%) and e-government (22%) are of relatively less importance to the respondents compared to other activities on the internet. One fifth of the respondents use the internet for searching job vacancies.
Nonetheless, still there are 62% of non-users. No interest and high costs ranked highest on the question what reasons they had for not using the internet. Other reasons named were knowledge barriers represented by low computer literacy and the appraisal of the high complexity of the internet. The cost argument is immanent when it comes to the question what measures can be taken to make the internet more attractive to non-users: 43% of the non-users would be interested in using the internet if computers were cheaper in purchase, for 39% of the non-users the cost of an internet access is an important barrier. Only 7% of the respondents would like to use a public access, which shows that they are more interested in an access at home. This corresponds to research results (Levine et.al. 1998) which suggest that computers at home allow "random" learning processes, which are as important as planned und structured learning processes. The least important things to push the non-users' interest for the internet were the extension of local and regional information on the internet and the extension of public online-services. Non-users see no benefits of using the internet and expect no changes in their lives when using the internet: 53% of the non-users said that internet usage wouldn't change their lives at all. Particularly elderly non-users have no idea how the internet could change their lives. Only in third place non-users mentioned that an internet access would improve their access to information important for their daily lives. Under the aspect of a lack of interest and a lack of perceived benefits, it is a high challenge to convince these population groups of the benefits an internet access might have for them.

## 3.2 Users and non-users in detail

We performed a logistic regression to compare in which groups of the population users and non-users are represented. Internet Usage is measured by the dependent variable "Are you using the internet?" with possible answers from zero ("no") to one ("yes"). The predictors sex, age, income, region, position in labour market and computer training were controlled for multicollinearity. 40% of the variance in the dependent variable can be explained by the predictors. The category with the highest value served as reference category (women, highest age, highest income group, urban setting and respondents still studying). All variables were coded as dummy variables.

| | **signifi-cance** | **Exp (B)** | **reciprocal of significant, but negative coefficients** |
|---|---|---|---|
| **Gender (reference group female)** | **0,02** | **1,75** | |
| **age** | **0,00** | | |
| 15-24 years | 0,00 | 6,81 | |
| 25-39 years | 0,00 | 5,83 | |
| 40-54 years | 0,00 | 3,65 | |
| **income (reference group 4. quartile)** | **0,15** | | |
| 1. quartile | 0,04 | 0,45 | -2,22 |
| 2. quartile | 0,07 | 0,56 | |
| 3. quartile | 0,30 | 0,74 | |
| **region (reference group urban regions)** | **0,14** | | |
| rural | 0,29 | 0,71 | |
| mixed | 0,39 | 1,36 | |
| provincial | 0,70 | 0,86 | |
| **position in labour market (reference group students)** | **0,00** | | |
| self-employed | 0,10 | 0,27 | |
| employed (general management or top management) | 0,95 | 0,95 | |
| employed position | 0,09 | 0,26 | |
| skilled manual worker | 0,01 | 0,16 | -6,25 |
| keeping household | 0,16 | 0,32 | |
| unemployed | 0,01 | 0,07 | -14,29 |
| retired | 0,04 | 0,16 | -16,67 |
| **Computer Training (reference group no training)** | **0,00** | 7,68 | |
| Cox&Snell $R^2$= 0,401 | | | |
| Nagelkerkes $R^2$= 0,546 | | | |

**Table 2: Logistic Regression on internet usage**

Internet users are mostly men and younger persons, as the results show. The probability of a young person (15-24 years) using the internet "is" nearly 7 times higher than for a person of the reference group 55+years. All age groups show significant effects when testing against the oldest age group. The predictor variable income shows only in one category significant negative effects on internet usage compared to the reference group with the highest income (fourth quartile). Region as a predictor variable shows no significant effects: all four types of region show no effect on internet usage, as one may hypothesize. We have not found regional effects which might give hints on distinct coverage with internet providers in more remote places. Respondents who do not actively participate in the labour market (retired persons or persons keeping the household) and blue-collar workers are not as likely to use the internet as students. Computer literacy measured by participation in computer trainings shows a strong effect on internet usage: respondents who attended a PC course have a 7.68 times higher probability to use the internet.

In a second step we combined the sociodemographic variables in a cluster analysis which resulted in four distinct groups. The groups are characterised by the variables internet usage, sex, education and position in the labour market. The

analysis gives hints which groups can use the internet to their advantage and increase their knowledge and position on the labour market and which groups are deprived in several ways. We decided to start with a sub sample (gained by random numbers) of 300 and performed a hierarchical cluster analysis to get starting values for k-means clustering with the whole sample. The data fit best within a 4-cluster-solution which was used as a starting value for k-means clustering with N=1.019. Together with the dichotomous variables sex and internet usage we used the likewise dichotomized variables education (low, medium, high) and position on the labour market (employed, not employed and still studying) to compute the clusters. All variables were z-standardized (Bacher 1996) und showed significant in the ANOVA-Table.

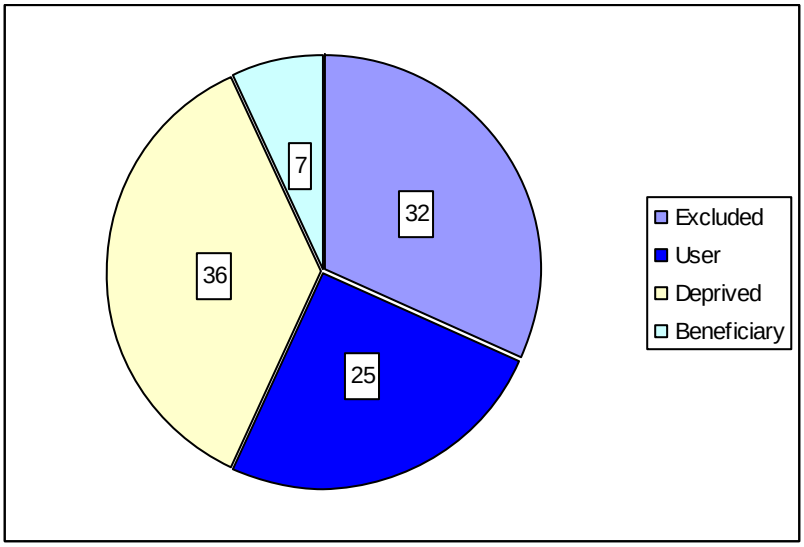


**Figure 2: Groups of Users and Non-Users [%]**

| | |
|---|---|
| Excluded | female, low education, house keeping, no internet usage |
| User | male, equally distributed among all education categories, working, internet users |
| Deprived | female, middle education, equally distributed among all categories of employment, no internet usage |
| Beneficiary | male, equally distributed among all education categories, students, Internet users |

**Figure 3: Characterization of the Clusters**

36% of the respondents can be categorized as "deprived" in access to the opportunities of internet usage. This group can be described as mostly female, employed and with medium education, and cannot be counted among the internet users. In contrast to the group of the "excluded", it is easier for the "deprived" to participate in social life because of their status of employment and their higher education level. The cluster of the "excluded" can be described as having low education (up to 15 years), mainly keeping the household and currently not employed (retired, unemployed). Members of this cluster do also not use the internet and are mostly female.

Internet users can be distinguished into two groups: the "users" and the "beneficiary". Both clusters can be described as mainly male. Compared to the

"user" the "beneficiary" has obtained higher education or is still studying respectively. Higher education allows this group to use the internet for their own personal forthcoming and the extension of their knowledge advances. In accordance with the so-called knowledge gap hypothesis, we can assume positive effects of education on literacy and media usage in general and therefore more benefits for highly educated Users as the beneficiary are. The authors of this hypothesis assumed that differences in access to mass media would result in differences in knowledge because of class specific usage behaviour: „*As the infusion of mass media information into a system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tend to increase rather than decrease*." (Tichenor et.al. 1970).
The structure of the cluster solution gives hints about coherences with the age distribution. As can be seen in table 3, cluster 1 ("excluded") contains mainly elder respondents, while cluster 4 ("beneficiary") consists mainly of younger persons.

| | 15 - 24 years | 25 - 39 years | 40 - 54 years | 55 years + |
|---|---|---|---|---|
| Excluded | 4 | 17 | 21 | 58 |
| Users | 11 | 42 | 37 | 10 |
| Deprived | 10 | 29 | 27 | 35 |
| Beneficiary | 82 | 18 | 0 | 0 |

Gamma= -.397**
** α=0,01

**Table 3: Age distribution of the four clusters (percentage)**

Quite obviously, we also found coherence between our cluster solution and a computer training of the respondents. More than two third of the groups "beneficiary" and "users" attended computer trainings whereas only every third member of the "deprived" and only every tenth member of the "excluded" have done so.

| | Computer training | No computer training |
|---|---|---|
| Excluded | 11 | 89 |
| Users | 65 | 35 |
| Deprived | 32 | 68 |
| Beneficiary | 69 | 31 |

CC= .420**
**α= 0,01

**Table 4: Cluster groups and computer training (percentage)**

The analysis shows step by step that there are certain groups of the Austrian population for whom social participation is hampered and who are not using the internet either. On the other hand we found groups who can be described as well integrated via their employment and higher education and who can use the internet for their own personal benefits and forthcoming like career planning and job search. The widening of this knowledge gap can be shown in a more impressive way in comparing the distinct contents on the internet named by the

different groups when asked for their (actual and hypothetic) preferences on the internet. According to the high amount of women in the groups "deprived" and "excluded", these two groups are especially interested in health topics. Our results are in accordance with Howard et.al. (2001), who also report about the special interest of women in health topics. In contrast, the group of the already "beneficiary" are looking for job vacancies and education offers on the internet. Therefore they are able to use the internet more extensively for their personal forthcoming.

| Excluded | Users | Deprived | Beneficiary |
|---|---|---|---|
| health | tourism | health | Labour market |
| cultural items | cultural items | tourism | education |
| tourism | health | cultural items | housing |
| pension | transport | Labour market | health |

**Table 5: Contents of interest (multiple respones possible)**

An analysis of perceived barriers (costs, knowledge, benefits) shows that the number of perceived barriers rises with increasing age. A small, nearly significant effect is yielded by the second lowest income group on perceived barriers. Especially the participation on computer trainings reduces the number of perceived barriers on internet usage.

| | Beta | significance |
|---|---|---|
| **gender (reference group female)** | 0,02 | 0,52 |
| **age** | 0,12 | 0,00 |
| **income (reference group fourth quartile)** | | |
| first income quartile | 0,02 | 0,53 |
| second income quartile | 0,06 | 0,06 |
| third income quartile | 0,03 | 0,38 |
| **region (reference group urban region)** | | |
| rural | 0,01 | 0,75 |
| mixed | -0,03 | 0,50 |
| provincial | 0,05 | 0,15 |
| **computer Training (reference group no training)** | 0,37 | 0,00 |
| | | Adj. $R^2$= 0,2 |

**Table 6: Number of perceived barriers on internet usage**

In analyzing questions on digital divide, it is important not only to ask about actual barriers but also to concentrate on perceived barriers which might be even more relevant. Attitudes and perception are working as a filter through which all learning activities and attitude changes are sent (Levine et.al. 1998, Stanley 2003).

# 4 Conclusions

Research on digital divide tries to answer the question whether the divide will close or not. Every second of the non-users said, that using the internet wouldn't change their lives at all. Our findings correspond to the qualitative study of Stanley (2003), where two out of five respondents did not see computer literacy as

a means to an economically, socially or informational enriched future. Fostering the awareness of non-users can be formulated as one major goal of future action programs like Katz and Rice (2002) have argued: "*Good intentions and well-meaning efforts are only a part of the equation. What we call the "other digital divide" is awareness. Awareness is not simply hearing a word or a name. It also means being aware of what the internet can do to serve ones own ends*."

Our analysis shows a strong linkage between demographic characteristics of the respondents and internet usage. In this sense it seems important not to artificially separate these two social phenomena and to acknowledge the strong linkage between e-inclusion and social inclusion: "*The link between digital and socioeconomic inclusion appears therefore to be structural*." (eInclusion revisited 2005). The results of the logistic regression for example, show differences in internet usage of men and women which might reflect structural differences in income and other resources as Bimber (2000) suggests.

The elaboration of various user groups might be only a first starting point. Needs and interests vary across users and non-users so that our groups should not be seen as homogenous. If digital divide should be overcome in an efficient way further analysis should be especially linked to the local context of the respondents. The new combination of demographic variables and internet usage yielded in four distinct types of Users and Non-Users and can be seen as a contribution to further research on typologies. The necessity of such research is already acknowledged by the research community: "*For instance, research about the relation of IST uptake and social milieus or lifestyles is only in its initial stage, but first results promise to add to the understanding of the digital divide*." (Selhofer and Hüsing 2002)

Furthermore it is not possible to formulate global needs and interests like politicians often prefer in short and soundful messages. For example, our analysis shows a contrarious message compared to primary reports to the EU in which more local contents on the internet are claimed (eInclusion revisited 2005). Local information ranked only on seventh place when respondents where asked for their preferences on internet contents.

## 4.1 Methodological remarks

Our secondary analysis can be seen as a plea to use the resources of data sets like the Eurobarometer to do more in-depth analysis compared to often hasty produced research reports which often cover only the main results in a more descriptive and not multivariate way. Data archives like the European Central Archive in Cologne[1] are helpful partners in provision and selection of appropriate data sets. Still there are too many data graveyards with data which could give important information to policy makers.

Of course, when dealing with a secondary analysis, one has actual not very much choices in operationalizing the variables needed for the specific research questions. For further analysis and new studies it seems very important to re-think the operationalization of the "dependent variable" internet-usage, because still to many studies deal with this issue in a rather unsophisticated way. Internet-usage should not only compound of the question "Have you ever used the internet?" but also take questions of frequency, intensity and content into account.

[1] http://www.gesis.org/ZA/index.htm

Another quite "white place" on the research landscape is the issue of attitude-behaviour research dealing with questions of digital divide. There are some studies which addressed such questions (Welker 2001, Levine et. al. 1998) but still there is lot of work to be done in combining the influence of demographics with main attitude patterns and perceived usefulness in a multivariate way. Furthermore especially questions about planned behaviour could be of interest for policy makers.

Our study examined four various groups of Users and Non-Users and give basic insights in their characteristics. For further understanding of reasons of using and non-using the internet it seems essential to apply qualitative research methods like in-depth-interviews and especially focus-groups to gain more knowledge about attitudes, perceptions and personality characteristics of the four user-groups. Furthermore there is a vital need to contrast research results dealing with needs and resources of users with expert's views and knowledge about their target groups. Our results give first insights in the complexity of sociostructural characteristics of users and non-users so that target groups can be better addressed by projects aiming to interest more people for the internet. Still there is a missing link in better connecting the knowledge about attitudes and perceptions of the users and non-users to practitioners and policy makers to develop more customized and efficient programs. Expert interviews could give hints about knowledge gaps between practice and policy aims and everyday life barriers of users and non-users (Gehrke 2004).

As a concluding remark on methodological issues we can formulate a need for more studies working with a triangulative approach, to overcome shortcomings of both: the qualitative and quantitative methods. Lazarsfeld (2002) formulated the following research rules which should also be applied in our filed of research in a very clear and unmistakable manner:

> "1.) For any phenomenon one should have objective observations as well as introspective reports.
> 2.) Case studies should be properly combined with statistical information.
> 3.) Contemporary information should be supplemented by information on earlier phases of whatever is being studied.
> 4.) One should combine „natural and experimental data". By experimental data, I meant mainly questionnaires and solicited reports, while by natural data, I meant what is now called „unobtrusive measures" - data deriving from daily life without inference from the investigator."

Triangulation studies could give more valid and reliable results for example through starting with a more exploratory qualitative approach to examine basic evaluation structures of potential users regarding to internet which could serve as response patterns in a structured questionnaire. Conversely results of quantitative analysis like clusters or causal models should be evaluated by in-depth-interviews.

## References

Anderson, R., Bikson, T., Law, S., Mitchell, B. (1995): Universal access to e-mail, Feasibility and social implications, Santa Monica.

Austrian national census of population 2001, Statistik Austria, Vienna.

Bacher, J. (1996): Clusteranalyse, Oldenbourg, München.

Bimber, B. (2000): The gender gap on the internet, Social Science Quaterly 81, pp. 868-876.

Mills B.F., Whitacre B.E. (2003): Understanding the Non-Metropolitan-Metropolitan Digital Divide, Growth and Change, Vol. 34 No 2 (Spring), pp. 219-243.

Di Maggio P., Hargittai, E., Neuman, W.R., Robinson, J.P. (2003): Social implications of the internet, Annual Review of Sociology, No. 27, pp.307-337.

European Commission (2005): eInclusion revisited: The Local Dimension of the Information Society, Brussels.

Gehrke, G. (ed.) (2004): Digitale Teilung-digitale Integration, Marl.

Goodman, S.E., Gottstein, J.B., Goodman, D.S. (2001): Wiring the Wilderness in Alaska and the Yukon. Breaking down the partitions that divide the digital world, Communications of the ACM, June,/ Vol. 44. No 6, p. 21 – 25.

Howard, P.E.N., Rainie, L., Jones, S. (2001): Days and nights on the internet, American Social Behavioral Scientist, Vol. 45, No. 3, p. 382-404.

Katz, J., Rice R. (2002): Social consequences of internet use, Cambridge University Press, Cambridge.

Kvasny, L., Keil, M. (2006): The challenges of redressing the digital divide: a tale of two US cities, Information Systems Journal 16, 23, pp. 23-53.

Labrianidis, L., Kalogeressis, T. (2006): The Digital Divide in Europe's Rural Enterprises, European Planning Studies Vol. 14, No 1 (January), pp.23-39.

Lam, J.C.Y, Lee, M.K.O. (2006): Digital Inclusiveness – Longitudinal Study of Internet Adoption by Older Adults, Journal of Management Information Systems, vol. 22, No 4 (Spring), pp. 177-206.

Lazarsfeld, P. (2002): The language of social research, Ed.: R. Boudon, Free Press, New York.

Levine, T., Donitsa-Schmidt S. (1998): Computer Use, Confidence, Attitudes and Knowledge: A Causal analysis, Computers in human behaviour, Vol. 14, No. 1, p. 125-146.

Guillén, M.G. , Suáreu, S.L. (2005): Explaining the Global Digital Divide: Economic, Political and Sociological Drivers of Cross-National Internet Use, Social Forces, Vol 84, No 2 (December), pp. 681-708.

Molina, A. (2003): The Digital Divide: The need fpor a global e-Inclusion Movement, Technology Analysis & Strategic Management, Vol. 15, No 1, p. 137 – 152.

Norris, P. (2001): Digital Divide, Cambridge University Press, Cambridge.

Selhofer H., Hüsing T. (2002): The Digital Divide Index - A Measure of social inequalities in the adoption of ICT, Proceedings of the 10th European Conference on Information Systems, Information Systems and the Future of the Digital Economy, ECIS 2002, Gdansk, Poland.

Stanley, L.(2003): Beyond Access: Psychosocial Barriers to Computer Literacy, The Information Society, No. 19, p. 407-416.

Stover, S. (2003): Remapping the Digital Divide, The Information Society, No. 19, p. 275-277.

Tichenor, P.J., Donohue, G.A. and Olien, C.N. (1970). Mass Media Flow and Differential Growth in Knowledge, Public Opinion Quarterly 34, p. 159-170.

Pinket, R. (2003): Community Technology and Community Building: Early Results from the Creating Community Connections Project, The Information Society, No 19, p. 365-379.

Van Dijk, J., Hacker K. (2003): The Digital Divide as a Complex and Dynamic Phenomenon, The information society, No.19, p.315-326.

Warschauer, M. (2003). Technology and Social Inclusion: Rethinking the Digital Divide, The MIT Press, Massachusetts.

Welker, M.(2001): Determinanten der Internet-Nutzung, Verlag Reinhard Fischer, Munich.

Wilson, E.J. II (2000): Closing the Digital Divide: An internal review. Draft Report for the Internet Policy Institute, Washington D.C.