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# The Internet and Knowledge Gaps

## A Theoretical and Empirical Investigation

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**ABSTRACT**

Although the knowledge gap hypothesis is often mentioned in connection with the social consequences of the Information Society, there is little discussion of its theoretical background or specific empirical evidence. Therefore, this article explores the theoretical potential of the knowledge gap perspective for Internet research and presents data based on two recent Internet surveys, which demonstrate a double digital divide. Access to the Internet in Switzerland is still dominated by well-educated, affluent, young males and between 1997 and 2000 the gap between those who do and those who do not have access widened not narrowed. Furthermore, there are gaps in the use of the Internet too. More educated people use the Internet more actively and their use is more information oriented, whereas the less educated seem to be interested particularly in the entertainment functions of the Internet.

**Key Words** digital divide, Information Society, Internet use, knowledge gap, political knowledge, Switzerland

The knowledge gap hypothesis is often mentioned in the public debate on the social consequences of the Information Society. Thereby optimistic scenarios of the future, like those, for example, of Bill Gates (1995) or Esther Dyson (1997), which are based on the assumption that the information society necessarily means an informed society for everybody, are called into question. But *pessimists* (e.g. Tapscott, 1996: 13; Golding,

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1998: 141ff.; Glotz, 1999: 224ff.; Kubicek and Welling, 2000) are worried for quite opposite reasons. They are afraid of an increasing digital divide, meaning a social gap between the information rich and the information poor – those without access to the computer and the Internet (Negroponte, 1995) – or between 'users' and 'losers' (Eichmann, 2000: 259ff.). It is predicted that the Internet threatens to divide society into two classes: the information elite on the one hand and those not linked to the Net on the other (Rosenthal, 1999). These concerns seem to be politically important because the underlying assumption is that information and knowledge translate into social power; inequalities in knowledge thus lead to exclusion from social resources and inequalities in social power (McLeod and Perse, 1994).

Nevertheless, in the policy context (NTIA, 2000) or in media debates (O'Malley, 2000), there is hardly ever reference made either to the theoretical background of the much cited knowledge gap perspective (Bonfadelli, 1994; Viswanath and Finnegan, 1996; Gaziano and Gaziano, 1996; Kwak, 1999) or to specific empirical evidence supporting the knowledge gap hypothesis. Not only is there a lack of solid empirical data that could demonstrate, for example, the advantages of Internet access over the use of the traditional mass media, but even from a theoretical perspective it is also rather unclear if the policy postulate of Internet access for everybody will be the necessary factor for success in the future – or if access to media or Internet information will be relevant at all. On the contrary, it could be suggested that, above all, growing access and thereby increased availability of information will result in the creation of an information elite and new knowledge gaps due to the Internet (Rosenthal, 1999: 69ff.), as was formulated by the knowledge gap hypothesis for the old mass media.

Therefore, this article has a twofold objective: the background and development of the knowledge gap perspective as well as its implications for online communication are outlined in the first, theoretical part of the article. Then the second part discusses some still controversial questions concerning differential access and use of the Internet on the basis of two new empirical Swiss surveys.

## The knowledge gap perspective

### *Basic hypothesis and scope*

In 1970, the knowledge gap hypothesis was explicitly formulated for the first time by Phillip Tichenor, George Donohue and Clarice Olien from

the Minnesota University, in their article 'Mass Media Flow and Differential Growth in Knowledge'. The basic hypothesis reads as follows:

> As the infusion of mass media information into a social 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 tends to increase rather than decrease. (Tichenor et al., 1970: 159–60)

The hypothesis is based on more than 20 years of mass communication effects research, demonstrating implicitly the 'apparent failure of mass publicity to inform the public at large' (Tichenor et al., 1970: 161), because media campaigns generally reach precisely those least in need of it, namely the already motivated and informed segments. So it runs against the widely held belief that the diffusion of information by the mass media will reach everybody and will thus result in an overall better informed public. The authors do not state that the segments of the population with lower socioeconomic status (SES) and/or low education remain completely ignorant or even that their knowledge will decrease in an absolute sense; rather the knowledge gap hypothesis posits a *relative* association insofar as the segments of the population with high SES and/or education will access, use and acquire the information supplied by the mass media at a *faster* rate and in a *more effective* way, and this will result in a knowledge lead. But this process is not irreversible, since knowledge gaps tend to decrease if mass media information on a given topic discontinues.

Besides the time factor, there are further contingent conditions concerning media topics: the knowledge gap hypothesis above all refers to political content or public affairs as topics of media reporting. Furthermore, Tichenor et al. always refer to *single* topics and do not mention knowledge in general. Therefore, to extend the knowledge gap hypothesis to *all* information available from the traditional media or the new Internet, or the total knowledge of the recipients – whatever that might mean – is misplaced or at least premature. Then there are ceiling effects to be considered too (Ettema and Kline, 1977). Even if media information about a certain topic is increasing, and despite the possibilities of the Internet, there is in most cases only a *quantitative* increase in the amount and the sources of information, whereas the range or diversity of arguments or the *depth* of thematic aspects, for example as a consequence of consonant media gatekeeping processes, often remains limited (Schulz, 1985: 109). In such situations, it is to be expected that media users experience a ceiling effect as well. This means that even the well informed

are not able to increase their knowledge any further. And as a consequence, the least informed segments will catch up more or less automatically and knowledge levels become equal over time. A good example is agenda-knowledge, i.e. 'knowledge of' an event like presidential elections. This type of knowledge cannot be increased, there is a ceiling effect – once everyone knows about the event the knowledge gaps close.

Another precondition is the societal setting. The original knowledge gap hypothesis refers to western industrial societies with fully developed media systems – press and television – that reach most of the population on a daily basis. In addition, more or less stable expectations concerning the principal information functions of the traditional media have been developed. However, the Internet is still more an infrastructure not a medium in the traditional sense: it reaches only small segments of the population and there is not yet a consensus about the information or entertainment functions of the Internet.

### *Theoretical background*

But back to the original hypothesis. Knowledge gaps are not seen as the result of a poorly functioning media system. The knowledge gap perspective rests instead on the assumption that the information flow is not normally homogeneous as a consequence of the underlying social structure of society. The five underlying factors or processes responsible for the emergence of knowledge gaps are as follows:

1. *Communication skills:* Better educated people are better able to manage communication in general and to use and interpret specific media information than less educated people (Grabe, 2000).
2. *Prior knowledge:* Better educated people possess more general knowledge on a broader range of public affairs topics (Price and Zaller, 1993). Therefore, the underlying cognitive frames enhance the recognition and acquisition of new information (Graber, 2001).
3. *Relevant social contacts:* Better educated people are integrated in broader social and/or local (Viswanath et al., 2000) networks that function as additional interpersonal information resources.
4. *Selective use, acceptance and storage of information:* Education correlates strongly with a general pattern concerning the civil duty of active information seeking.
5. *Structure of the media system:* Modern media systems are differentiated insofar as most public affairs information is distributed

by the print media. These information-rich media are used much more by the better educated media users, whereas the less well-educated segment of the population is dependent more on television as its main information source (McLeod and Perse, 1994).

### *Deficits, differences and contingencies*

Most of the aforementioned factors are not situation specific. Thus, the basic knowledge gap hypothesis rests on the assumption that education is strongly tied to a specific pattern of media usage that can be described as active, intensive, information oriented and print dependent. Authors like Ettema and Kline (1977), Dervin (1980) or Viswanath et al. (1993), however, have pointed to other, more *situation-specific* and *motivational* factors. Empirical research has proved that knowledge inequalities based on educational deficits can be altered or reversed – at least partly – by factors like personal relevance or interest. Yet, interest and education are not always independent but correlated, as Wirth (1997) empirically demonstrated. As education increases there is in many cases an increase in topic-specific interest too. Education and personal interest thus often work as additive and mutually reinforcing factors.

Accordingly, two rival explanatory models (see Figure 1) have been discussed. Traditional proponents of the knowledge gap hypothesis regarded the motivational factors as secondary; it is not a factor independent of education because the higher the education the greater the motivation. Other researchers like Genova and Greenberg (1979) or Ettema and Kline (1977) instead treated education and motivation (e.g. issue interest or degree of concern) as independent factors in the process of acquiring media information and tried to prove that not education but unequal interest and motivation are crucial for the development of knowledge gaps. Consequently, some researchers (e.g. Horstmann, 1991) regarded the knowledge gap hypothesis as unsupported or even disproved by the empirical research.

Taken together, these two rival explanations suggest a third, a contingency model (Kwak, 1999), that rests on the assumption that the emergence of education-based knowledge gaps will be moderated in many situations by motivational factors. According to Viswanath et al. (1993: 559): 'In our view, the issue is not motivation or education; it is motivation and education as they operate jointly to affect knowledge.' For example, only moderate knowledge gaps are to be expected with regard to controversial topics on the macro-level of society: controversy

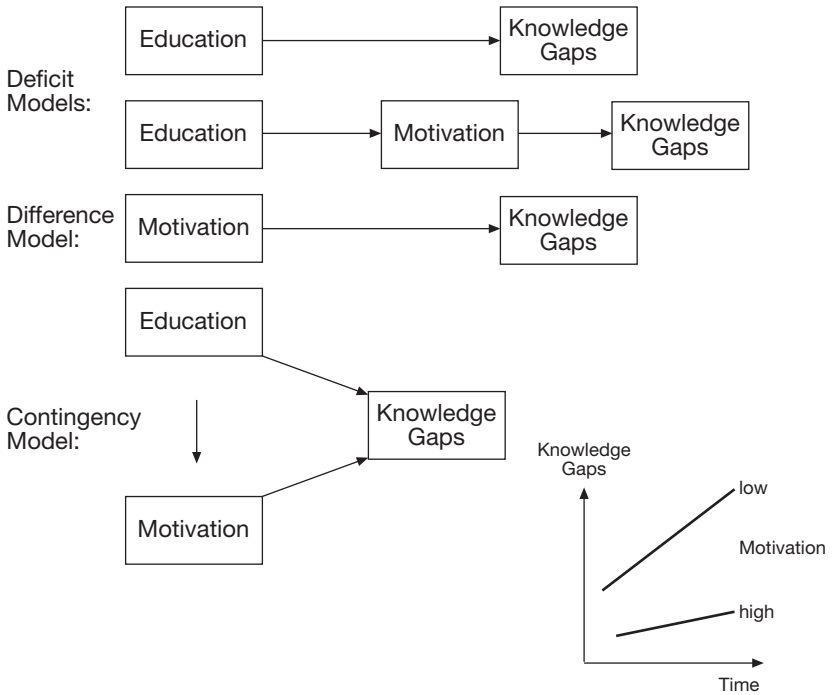


**Figure 1** Rival explanatory models of knowledge gap phenomena

stimulates communication and information seeking, and more people acquire more knowledge. But political interest alone without a minimum of cognitive resources, e.g. in the form of pre-existing knowledge and schemata, does not seem enough to stimulate information seeking and knowledge gain in many situations. Therefore it is the task of empirical research to study how cognitive factors like education or pre-existing knowledge as well as motivational factors like personal interest work together in specific situations (see Figure 1).

### *Different types of information and knowledge*

Advocates of the so-called difference model (Dervin, 1980) criticize how knowledge is conceptualized and measured in most of the empirical knowledge gap research (Figure 2). There is almost no differentiation made between different types of knowledge like topic or factual vs structural or background knowledge. In addition, many knowledge measures have been based on schoolbook-type questions with a middle-class bias. That is why there is a controversy among experts, whether the

| Traditional: Object-Oriented | Innovative: User-Oriented |
|---|---|
| Agenda/topics | Background knowledge |
| Knowledge of facts | Knowledge about structures |
| Places and persons | Causes and consequences |
| Concrete/classifications | Abstract/relational |
| Close/obtrusive | Distant/unobtrusive |
| Horizontal (width) | Vertical (depth) |
| Explicit | Implicit |
| Recognition/recall | Reconstruction/inference |

**Figure 2** Different conceptualizations and measurements of knowledge

average citizen is not at all well informed or as knowledgeable as they should be (Graber 2001: 43ff.), or if this is largely a result of these widely used but seriously flawed factual knowledge indicators. It can be expected that knowledge gaps would be lower in empirical studies using not object-oriented but user-oriented knowledge indicators and open-ended knowledge questions and procedures that encourage respondents to think about issues from multiple perspectives instead of traditional tests of factual knowledge of the political system or public policy issues.

### *Different types of gaps in the communication process*

A further refinement of the knowledge gap paradigm deals with the following question: at what point in the process of communication will gap phenomena occur? Surprisingly, no clear distinctions can be found in the early knowledge gap publications, either in theoretical considerations or in empirical studies, concerning (1) gaps in the information supply, (2) gaps in access to and (3) use of this information, (4) gaps in the processing of this information and finally (5) gaps in the resulting knowledge.

Knowledge gaps will develop on a first level simply because different social segments belong to different media environments that enlarge or restrict the available information diet. This trend will be further strengthened by the tendency of most media to tailor their information more and more to specific target groups. Thus, relevant gaps in information supply will develop as a result of increasing topic-specific information namely in those media channels that are used predominantly by the better educated segments. Therefore there are significant supply gaps in the domain of political information, e.g. between public and commercial television channels or between quality and tabloid newspapers in most European countries. But even if media users belong to

different media environments, the information supply is not totally different due to shared journalistic information values and practices. Information supply gaps will develop too as a result of the differential diffusion of new media like the Internet. Knowledge gaps can develop on a next level because of unequal use of media information even if the available information diet is the same for different social segments. Media users vary concerning their thematic interests and media information is attended to differently according to these preferences. Numerous empirical studies demonstrate correlations between content preferences specifically for political information and demographic variables like education. Gaps also occur as a result of different reception strategies. The same information used can be processed and stored differently as a result of the underlying expected media gratification – e.g. information vs entertainment – differences in the level of cognitive media attention, or unequal information-processing strategies.

### *Application of the knowledge gap perspective to the Internet*

This differentiation in time concerning the origins of knowledge gaps enhances not only the conceptual clarity of the knowledge gap paradigm (Wirth, 1999: 8) but also makes it possible, for example, to optimize information campaigns directed towards specific target groups or to clarify the question whether the Internet will foster the knowledge gap or not. A recent American survey, carried out at Stanford University by Nie and Erbring (2000), came to the conclusion that the Internet causes above all gaps in the phase of supply and access of information but not in the use of information; the question concerning gaps in the phase of reception is still open to discussion of course. In this regard it is often mentioned that meaningful use of the Internet has to be based on new skills like purposeful searching strategies, assessment of source credibility or construction of meaningful frames for interpretation. These functions are usually carried out for the audiences by journalists in the old media.

Figure 3 illustrates differences concerning the emergence of knowledge gaps between traditional media like television or the press and the Internet. Knowledge gaps in the old media seem to be mainly the result of differences in topic-related interest because overall levels of access to and use of mass media are high and there is a rather homogeneous supply of information from the mass media journalists. In comparison to the old media, new factors emerge in the case of Internet. On the one hand, the supply of information by the Internet is not structured by journalists and therefore heterogeneous and potentially unlimited, and on the other

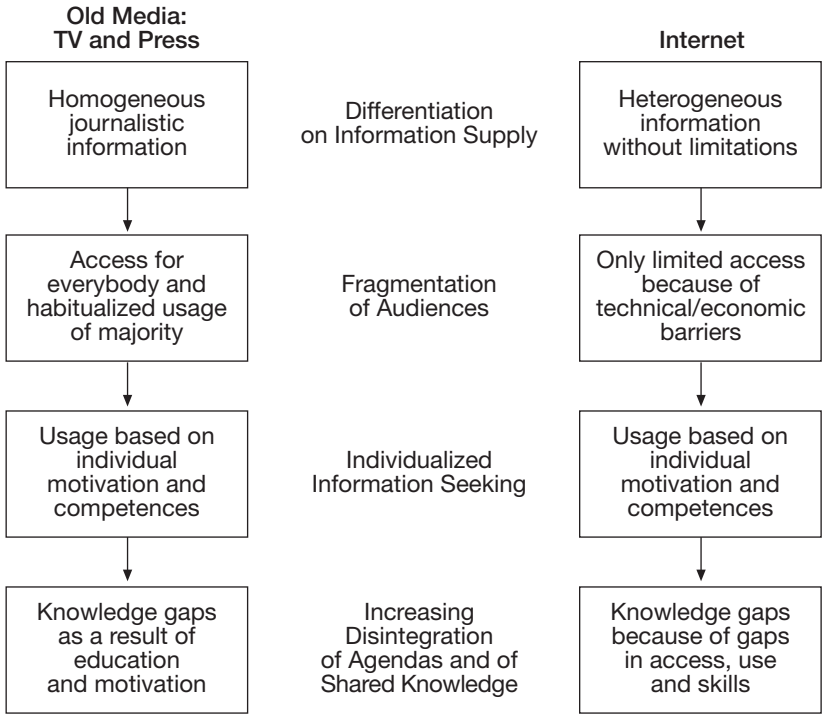


**Figure 3** Consequences of the knowledge gap perspective for the Internet

hand, access to the Internet is still restricted in most countries. Furthermore, in comparison to the old media, use of the Internet requires a much more active and skilled user. To sum up, it can be hypothesized that in comparison to the traditional media the Internet fosters audience fragmentation and individualized information seeking; and this could result in an increasing disintegration of individual agendas and the amount of shared knowledge. That is why Doris Graber (2001: 166) in her book *Processing Politics* asks the question: 'If citizens do not drink from the same well of information, will they splinter into communication ghettos?'

## Internet gaps: new empirical evidence

In this second part of the article, new empirical evidence is presented that demonstrates education-based gaps in access and use of the Internet. These secondary analyses, conducted by the author, are based on two new, large and representative surveys carried out in Switzerland.

### *Research design, methods and samples*

In Switzerland, the WEMF (AG für Werbemedienforschung)[1] measures the use of print media for advertising companies on a regular basis. Its MACH Basic study takes the form of a telephone survey, and is based on representative samples of about 10,000 people 14 years and older. The survey is carried out twice a year, and contains questions concerning access and use of the Internet together with other demographic data like age, sex, education and income. The huge resultant database, known as MA Net, helps to answer several questions: (1) What kind of access gaps characterize this new medium? (2) Is there evidence of gaps in access narrowing over time? (3) And if yes, for which social segments?

Furthermore, in September and October 1999 the WEMF carried out, for the first time, a new telephone survey, the so-called MA Comis 1999, based on a representative sample of over 2000 users of personal computers with and without access to the Internet, and a year later a similar follow-up study – MA Comis 2000 – was carried out.[2] To ensure comparability with the data from the MA Net study, the following analyses are based on two subsamples of 853 (1999) and 1557 (2000) people who use the Internet at least several times per month at home. This subgroup is referred to by the WEMF as 'narrow usership'. The core of the MA Comis surveys consists of quantitative questions concerning frequency of and time spent using the Internet in general, use of specific Internet sites and the types of Internet content used; other more qualitative questions deal with attitudes to the Internet, or self-rated Internet competence. Based on this second data set, the following two hypotheses formulated by Nie and Erbring (2000) in their American study, 'Internet and Society', are examined: (1) there are still some, although narrowing demographic differences in Internet access; (2) but there are few demographic differences in Internet use.

### *Gaps in access to the Internet*

In the summer of 1997, 10.8 percent of the Swiss respondents, aged 14 years and older, had access to and used the Internet at least several times a month. Comparable figures for Germany or Austria were significantly lower, 6.5 percent and 5 percent respectively. Use of the Internet (narrow usership) increased between 1997 and 1999 in Switzerland to 26.3 percent. The comparable figures for Germany and Austria were still lower in 1999 (17.7 percent and 13 percent respectively). Meanwhile (between

October 1999 and March 2000), Swiss Internet usage increased to a third of the population (33.4 percent). This equals an absolute increase of 23 percent or a relative increase of more than 200 percent over the three years (see Table 1). However, the USA is still ahead of Europe: the share of individuals using the Internet there rose by 35.8 percent, from 32.7 percent in December 1998 to 44.4 percent in August 2000 (NTIA, 2000).

What demographic differences in access to the Internet are hidden then beneath these data on average Internet use? Table 1 shows not only access gaps based on level of education but on three other dimensions too. However, education seems to be the crucial factor, followed by income; differences based on age and sex are less strong. Taken together it can be said that the typical Swiss user of the Internet is well educated, affluent, young and male.

**Table 1** Development of gaps in Internet access in Switzerland

| *Users (%)* | *May–October 1997* | *1997/8* | *May–October 1998* | *1998/9* | *May–October 1999* | *1999/2000* | *Increase* |
|---|---|---|---|---|---|---|---|
| Total | 10.8% | 15.6% | 19.1% | 24.7% | 26.3% | 33.4% | +23% |
| Men | 16 | 23 | 27 | 34 | 35 | 43 | +27% |
| Women | 6 | 8 | 12 | 16 | 18 | 24 | +18% |
| Sex Gap | +10% | +15% | +15% | +18% | +17% | +19% | |
| 14–29 years | 14 | 22 | 29 | 40 | 40 | 50 | +36% |
| 30–39 years | 14 | 22 | 24 | 29 | 33 | 41 | +27% |
| 40–49 years | 13 | 16 | 18 | 26 | 29 | 37 | +24% |
| 50 years plus | 4 | 6 | 8 | 9 | 10 | 15 | +11% |
| Age gap | +10% | +16% | +21% | +31% | +30% | +35% | |
| Over 8000 SFr. | 22 | 28 | 37 | 44 | 46 | 56 | +34% |
| 4000–8000 SFr. | 9 | 13 | 17 | 22 | 23 | 30 | +21% |
| Up to 4000 SFr. | 4 | 7 | 6 | 10 | 10 | 12 | + 8% |
| Income gap | +18% | +21% | +31% | +34% | +36% | +44% | |
| University | 32 | 47 | 47 | 54 | 60 | 69 | +37% |
| Gymnasium | 19 | 27 | 32 | 40 | 44 | 52 | +33% |
| Trade school | 7 | 10 | 14 | 19 | 23 | 29 | +22% |
| High school | 3 | 5 | 6 | 10 | 14 | 19 | +16% |
| Education gap | +29% | +42% | +41% | +44% | +46% | +50% | |

Table 1 displays the percentages of the total population or certain subgroups that used the Internet at least several times per month in the previous 12 months.
*Source*: Own calculations based on the MA Net study, WEMF, Switzerland.

The next hypothesis refers to the development of gaps in access to the Internet over time. Here, Table 1 clearly shows that gaps in access to the Internet in absolute terms did not narrow in Switzerland over the period studied. Instead, and contrary to the available American data, there is clear evidence that the demographic differences in access to the Internet were exacerbated between 1997 and 2000. Thus access to the Internet increased in absolute terms between 27 percent (men) and 37 percent (university-level education) in the privileged segments of society, whereas increases were much lower, namely between 8 percent (low income) and 18 percent (women), in the underprivileged segments.

To sum up: the Swiss data concerning access to the Internet are consonant with the knowledge gap hypothesis. There are not only education-based gaps in access but there are other demographic differences like income, sex and age in access too. And these gaps did not narrow over the three years studied. As hypothesized on the basis of the knowledge gap perspective, diffusion and adoption of the Internet took place earlier and at a faster rate in the high SES segment than in the lower SES sector. In comparison, according to Nie and Erbring (2000), whose study is based however on a much smaller sample of only 4113 persons, access to the Internet in the US was 38 percent in 1999, still higher than in the German-speaking European countries. By June 2001, US access increased dramatically to 58 percent (e.g. ComScore Networks, 2001). Although there is clear evidence for similar disparities in access to Internet concerning education and age in the USA and Europe, gender differences only seem to be narrowing in the US so far (Nie and Erbring, 2000; ComScore Networks, 2001).

There are several plausible explanations for these gaps in access to the Internet, whereby motivational as well as cognitive factors probably interact in complex ways. Whereas women and older people still seem to attach only marginal personal benefits to the Internet, people with higher education expect more gratifications from the Internet and dispose of more cognitive resources as a necessary prerequisite to the use of the Internet. That the diffusion of the Internet is also especially high in the affluent segment seems to indicate there are economic barriers at work like hardware costs and persistently high telephone rates in the European countries. Still not clear at the moment is the future development of these disparities. Will there be a narrowing of gaps in access in the coming years – especially concerning sex and age differences – since development of diffusion and adoption of the Internet is still at an early phase, or will certain gaps persist over time because of a lack of necessary skills, perceived utility or enough money?

### *Gaps in use of the Internet*

As stated earlier, the MA Comis surveys of 1999 and 2000 included several qualitative questions concerning the specific modalities of use and attitudes towards the Internet. Table 2 shows that there are marked educational differences on several of these indicators. Internet users with a higher educational background have had Internet access for a longer time – 'veterans' vs 'novices' – and access the Internet more frequently than users of the Internet with a lower education.

The comparison between 1999 and 2000 shows some tendencies too: on the one hand, the segment of novices decreased slightly from 72 percent to 65 percent, and on the other hand the frequency of daily Internet use increased from 47 percent to 54 percent. As a consequence of this habitualization and intensification of Internet use, the education-

**Table 2** Educational differences in modalities of Internet use (in percentages)

| | | *Educational background* | | | |
|---|---|---|---|---|---|
| *Autumn 1999* | *Total* | *Low* | *Medium* | *High* | *Gaps* |
| Access to Internet | | | | | |
| Veterans (more than 3 years) | 28 | 12 | 24 | 33 | +21% |
| Novices (less than 3 years) | 72 | 88 | 76 | 67 | −21% |
| Frequency of Internet use | | | | | |
| Daily | 47 | 28 | 45 | 52 | +24% |
| Several times per week | 31 | 33 | 32 | 29 | −4% |
| Several times per month | 22 | 29 | 23 | 20 | −9% |
| Internet used yesterday | 58 | 44 | 54 | 65 | +21% |
| *Autumn 2000* | | | | | |
| Access to Internet | | | | | |
| Veterans (more than 3 years) | 35 | 17 | 31 | 45 | +28% |
| Novices (less than 3 years) | 65 | 82 | 69 | 53 | −29% |
| Frequency of Internet use | | | | | |
| Daily | 54 | 46 | 51 | 63 | +17% |
| Several times per week | 29 | 35 | 29 | 27 | −8% |
| Several times per month | 17 | 19 | 20 | 11 | −8% |
| Internet used yesterday | 66 | 57 | 63 | 74 | +17% |

$N = 853$ and 1757 Internet users.
*Source*: MA Comis 99 and 2000 surveys, WEMF, Switzerland.

based gaps in use of Internet decreased too. Contrary to that, the gap concerning experience of Internet use increased as a result of more less educated new users of the Internet in the year 2000.

Further questions were asked to measure more qualitatively the specific Internet content used by people with different educational backgrounds, but without differentiation of usage at home or at work. The analyses (see Table 3) show that more than 75 percent of Internet users use applications of the Internet like communication by email, consultation of railway or flight schedules and use of search engines. Between 40 percent and 60 percent use the Internet to consult daily news and access the archives of online papers, to plan journeys, for further education, to download software, to order goods by e-shopping or to make use of the weather forecast. Electronic banking, making travel reservations, chatting, playing games or taking part in discussion groups over the Internet were still rather less common applications for most Internet users in 1999, with figures ranging between 25 percent and 33 percent.

**Table 3** Content-specific use of the Internet, 1999–2000 (in percentages)

| *Internet content use* | *1999* | *2000* |
|---|---|---|
| Email | 96 | 92 |
| Railway/flight schedules | 80 | 70 |
| Search engines | 76 | 85 |
| Online press archives | 59 | 51 |
| Travel planning | 51 | 52 |
| Online newspapers | 47 | 56 |
| Further education | 45 | 50 |
| Software download | 41 | 62 |
| E-shopping | 41 | 49 |
| Weather forecast | 39 | 46 |
| Job advertisements | 33 | 33 |
| Electronic banking | 33 | 35 |
| Travel booking | 30 | 37 |
| Chatting | 26 | 34 |
| Playing games | 25 | 40 |
| Music: listening, download | 25 | 39 |
| Discussion groups | 13 | 17 |
| Surfing (asked only in 2000) | – | 64 |

$N = 853$ and 1757 Internet users.
*Source*: MA Comis 99 and 2000 surveys, WEMF, Switzerland.

Interestingly, there are certain trends in content-specific use of the Internet emerging: the use of search engines and downloading software increased from 1999 to 2000, but percentages using the Internet for entertainment purposes like playing games and accessing music also increased significantly.

Table 4 displays differences between educational segments. These results do not support the hypothesis formulated by Nie and Erbring (2000), that there are almost no educational differences in use of the Internet if people only have access to this new medium. In Switzerland at least, there are significant educational differences in the content-specific use of the Internet.

People with higher education use the Internet for informational and service-oriented purposes; people with lower education use the Internet significantly more for entertainment reasons. To summarize, the almost unlimited amount of content made available by the Internet together with the requirement of active selection by the user obviously produces a great variety of individual content-specific usage patterns. Besides, educational differences, gender and age also discriminate between Internet users. Men use search engines more than women, access current and archive information from online papers more and are more interested in

**Table 4** Caps in content-specific use of the Internet 1999–2000 (in percentages)

| | | | *Educational background* | | | |
|---|---|---|---|---|---|---|
| | | *Total* | *Low* | *Medium* | *High* | *Gaps* |
| Internet content used | | | | | | |
| Communication | 1999 | 96 | 87 | 94 | 98 | +11% |
| | 2000 | 92 | 90 | 92 | 94 | +4% |
| Information | 1999 | 61 | 43 | 59 | 66 | +23% |
| | 2000 | 59 | 53 | 58 | 64 | +13% |
| Services | 1999 | 34 | 18 | 34 | 36 | +18% |
| | 2000 | 41 | 31 | 41 | 45 | +14% |
| Entertainment | 1999 | 25 | 56 | 29 | 19 | −37% |
| | 2000 | 42 | 72 | 42 | 35 | −35% |

*Note*: The following groupings, based on means, have been made: (1) communication: email; (2) information: railway/flight schedules, telephone directories, search engines, archives and information of online papers, further education; (3) service: download of software, electronic shopping or banking, to book voyages and order tickets; (4) entertainment: games, music, chats, surfing (asked only in 2000).
*Source*: MA Comis 99 and 2000 surveys, WEMF, Switzerland.

further education and e-banking. And younger users of the Internet are significantly more interested than older people in chatting, games and music on the Internet (see also van Dijk, 2000).

### *Gaps in skills and attitudes towards the Internet*

Finally, there are just a few, more indirect remarks to be made concerning gaps in the reception process; these questions were only included in the 1999 survey. One question is based on self-rated personal computer skills and another measured attitudes towards new media like the Internet. Table 5 shows that a majority of Internet users with low educational background see themselves as beginners (43 percent), while 85 percent of the well-educated users of the Internet rate their computer skills as at least advanced or even ambitious.

It is not surprising that almost 80 percent of the people in the survey using the Internet on a regular basis have positive attitudes towards new media in general insofar as they think that these new media are very important technical innovations that must not be missed out on. Furthermore, almost 60 percent are fascinated by the Internet and other new media innovations. While the first more cognitive or rational argument correlates significantly with the educational background, less

**Table 5** Gaps in skills and attitudes towards the Internet (in percentages)

| | | *Educational background* | | | |
|---|---|---|---|---|---|
| | *Total* | *Low* | *Medium* | *High* | *Gaps* |
| Self-rated computer skills | | | | | |
| Ambitious users | 31 | 15 | 28 | 36 | +21% |
| Advanced users | 48 | 42 | 49 | 49 | +7% |
| Beginners | 21 | 43 | 23 | 15 | −28% |
| Private email address | 67 | 52 | 64 | 72 | +20% |
| Attitudes towards Internet | | | | | |
| 'The new media are important and should not be missed out on' | 79 | 67 | 77 | 84 | +17% |
| 'I am really fascinated by the Internet and other innovations in the media' | 59 | 67 | 62 | 56 | −11% |

$N = 853$ regular users of Internet.
*Source*: MA Comis 99 survey, WEMF, Switzerland.

educated Internet users react more strongly in an unspecific emotional way. This is consistent with the aforementioned fact that less educated people use the Internet predominantly because of its entertainment functions.

## Summary and conclusions

The empirical evidence presented in this article, based on secondary analyses of two new and representative Swiss surveys, documents various educational gaps in access to the Internet. Furthermore, these gaps do not seem to be narrowing, at least at the moment; rather these gaps widened between 1997 and 2000. Based on this evidence, political slogans and claims like 'Internet access for everybody' should be taken seriously but considered carefully too. Internet access alone obviously does not automatically guarantee an informed and knowledgeable public. Besides gaps in access, further gaps in the content-specific use of the Internet are obvious if one looks at the ways people connected to the Internet make use of its content. The higher the educational background, the more people use the Internet in an instrumental way, and the lower the educational background, the more people seem to use the Internet only for entertainment purposes (Shah et al., 2001).

There are at least four barriers to people benefiting in a wider sense from today's information society: (1) there is still a lack of basic computer skills and connected fears and negative attitudes especially among older and less educated people; (2) even if people acquire basic computer skills, there can be barriers to access especially since these new media are expensive; (3) there are further barriers because of a lack of user friendliness; and (4) the gaps in the way the Internet is used are mostly education based. Is there a dominance of entertainment functions? Or will the Internet be used too in an instrumental way, e.g. to get a deeper understanding of what is going on in society?

Taking a more theoretical perspective, not only the public debate on the digital divide but Internet research too is still based on a traditional technology-centred paradigm and therefore does not reflect the inherent complexities of the processes of diffusion, adoption and integration of the Internet as a new medium in society. As a consequence, we still do not have a deeper understanding of the so-called 'digital divide' phenomenon at the moment, since most research has presented access data only. What people really do when linked up to the Internet needs further and much more refined research. But this research has to be based on a user perspective looking at technology as embedded and shaped socially. Thus,

inequality is not only a matter of inadequate supply of content or not having access to Internet. Rather, it means that inequality has to be conceptualized as structural and must be studied with a focus on social processes of mediation. So, the behaviour of the non-users is not irrational or just the result of not being aware of the Internet, but has to be understood as purposeful and rational within a social environment based on limited possibilities of choice. And even if there is a decided increase in overall Internet use, we still lack empirical studies demonstrating how and for what purposes people use the Internet.

These theoretical considerations have policy implications too. Since most of the recent American research – based on access data only – seems to demonstrate convergence processes, some experts advocate no future oriented public policy at all or at least policy measures with a narrow focus on infrastructure improvement only, like more access to the Internet at schools or in libraries. Instead, media policy based on the assumption that technology is embedded and shaped socially has to focus not only on questions of supply and access, but on the content, e.g. educational, provided by the Internet and on the necessary communication skills of the potential Internet users.

## Notes

1. The author is a member of the WEMF research commission.
2. There are certain differences between the two MA COMIS surveys: first, the second survey (2000) was based on a representative sample of people having access to the Internet, and of these 1757 (83 percent) used the Internet at home at least several times per month (referred to as narrow usership), whereas the first survey (1999) was based on a representative sample of 2000 people using computers, 853 (43 percent) of them used the Internet at least several times per month. Secondly, several attitude-oriented questions were included only in the first survey of 1999.

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