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# Not so 'techno-savvy': Challenging the stereotypical images of the 'Net generation'

Sheila Zimic

## Abstract

*It is often argued that young people growing up in the presence of the Internet and new media are 'techno savvy'. They are often distinguished as a new generation because of their relationship with new media, which is assumed to be considerably different, in comparison, to older generations. This new generation has also been characterized as the 'Net generation' (Tapscott, 1998). However the stereotypical images of 'net geners'—being technologically savvy—have rarely been questioned. This article aims at nuancing these images with the objective of exploring the stereotypical images, rather than proving if the images are true or false. By using a statistical representative study of Swedish people's Internet behaviour and linking the results to an analytical frame of Internet skills, the question, "what is it young people know when it comes to the Internet use and how is it related to the stereotypical image of the 'Net generation'?" is explored. The main findings suggest that various Internet activities differ by age and few activities could be ascribed solely to the so-called 'Net generation'.*

## Keywords:

*Net generation, stereotypical images, Internet skills, self-efficacy, techno-savvy*

## Introduction

It is often argued that young people growing up in the presence of Internet and new media are 'techno savvy'. They are assumed to possess new media skills and attitudes which older generations do not. This is assumed to be the main reason for the perceived technological generation gap between the young people and their parents, teachers and other adults. This new generation has been positively characterized as the 'Net generation' (Tapscott, 1998) or 'Digital natives' (Prensky, 2001) or even 'Millennials' (Howe and Strauss, 2000) due to their often-unquestioned proficiency in accessing and using technology and new media. However these positive images of young people being technologically savvy have rarely been questioned (Bennett et. al. 2008). To a certain extent, they have been taken for granted.

This article aims at nuancing these overly optimistic images. The objective is not to prove if the stereotypical images are true or false, but to explore stereotypes prevalent in the literature. This is achieved by drawing on a statistical representative study of Swedish people's Internet behaviour and linking the results to an analytical frame of Internet skills (Hargittai, 2005; Potosky, 2007; van Dijk & Hacker, 2003; Livingstone et. al., 2005) to explore the question, "what is it young people know and how is it related to the stereotypical images of the 'Net generation'?"

The stereotypical images the article nuances are perceptions pertaining to whether or not all 'net geners' are Internet users and generally accepted understandings that they tend to use the Internet in similar ways or in similar locations. The article also explores the extent to which generational differences between the 'net Generation' and older generations affect Internet behaviours. Additional stereotypical images explored include the extent to which 'net geners' rely on the internet over more traditional media forms, whether they really are 'techno-savvy' or meeting the criteria of what is

sometimes referred to as the “MySpace generation” (Rosen, 2007) due to their use of web 2.0 related activities such as social networking.

## Review of the literature

In the EU Kids Online report from 2007, twenty-five European countries are compared regarding children’s and young people’s Internet use (Hasebrink, Livingstone & Haddon, 2007). The results are based on Eurobarometer’s data regarding children less than 18 years of age. The report shows Internet adoption among children varies from about 30 percent up to 70 percent across European countries. Sweden is one of the countries where Internet adoption is largest (among children 66% and among their parents 97%). Internet access at home is also high, with 61 percent of Swedish children accessing the Internet from home. According to the 2008 World Internet Institute’s study used in this article, Internet usage among Swedish children 3-18 year olds is 73%, where 1 of 5 of the youngest ones (3 year olds) use the Internet occasionally and almost all (92-99%) teens and ‘tweens’ (11-18 year olds) use the Internet on a more regular basis (weekly or daily). Other Swedish studies on (young) people’s Internet use also show high Internet adoption and Internet use (Medierådet: Ungar och Medier 2008; Nordicom: Internetbarometer 2007; Statistics Sweden: Use of computers and the Internet by private persons in 2008).

A complementary study by Livingstone & Helsper (2007) show that in the UK, like in other developed countries, there are few children who are not using the Internet and that the previous conception of digital divide between haves and have-nots is no longer applicable to young people. However, they discovered inequalities by age, gender and socioeconomic status in relation to children’s Internet use. The main findings are that older children use the Internet more when compared to younger children. It is also reported that girls use the Internet more at a younger age (9-15) while boys use the Internet more frequently at an older age (16-19). The report also found that expertise in using the Internet is crucial for opportunity take-up. Those who are more skilled at using the Internet use it more often. Furthermore, the report highlights how expertise has a greater impact than age (Livingstone & Helsper, 2007). There are few studies that have addressed the issue of digital inequalities among children and young people. Additionally, few reports have been critical of stereotypical images of the ‘Net generation’ (Livingstone & Helsper, 2007; Cheong, 2008; Bennett et. al. 2008; Sherry and Fielden, 2005; Facer and Furlong, 2001).

Bennett, Maton and Kervin (2008) emphasise that there are studies indicating that youngsters are highly familiarized with technology and use it for various activities. They also emphasise that there are large percentages of youth who do not have access to technology or the digital skills often ascribed to ‘digital natives’ (Bennett et. al. 2008). This, according to Bennett, Maton and Kervin (2008), could lead to a neglect of those who are less interested or less able to use new technology, especially when socio-economic and cultural factors are overlooked. Sherry and Fielden (2005) suggest that ‘millennials’ (born after 1983) are more confident with technology compared to older generations, most likely because they were more likely to have studied computer technologies in school. They also found millennials more confident in teaching themselves to use computers. However, Microsoft Word was the only application on which millennials scored significantly better than their older cohorts. Sherry and Fielden’s (2005) findings emphasize that the millennial cohort is not as competent with computers as they are confident in their perceived abilities.

Cheong (2008) critically examined the techno-savvy image of young adults in Singapore where the majority of youth have access to the Internet. Cheong found that

young people's Internet skills and problem-solving behaviour varied. A significant proportion were unfamiliar with solving computer related problems, while others said that they were able to diagnose and solve computer problems on their own, or with some help from technical support staff. Based on the results, Cheong states that there are secondary digital divides among young adults when it comes to Internet skills, problem-solving behaviour and Internet usage patterns. This all challenges the often unproblematised image of techno-savvy youth (Cheong, 2008). Facer and Furlong (2001) also found that there are children who are 'low' computer users. The 'low users' were interviewed and some themes regarding their position in the margins of the digital society were identified. Firstly they identified that their access to computers at home are not only dependent on their socioeconomic status, but also the family's value towards purchasing and using a computer (Facer & Furlong, 2001). Secondly, it seems as if the lack of access at home does not increase computer use in other places. Those who have computer access at home, are more likely to take opportunities to use computers in other places such as school or at friends' homes. Thirdly, the children who are low computer users, referred to the ones having a computer at home as the 'brainy ones,' meaning that they most likely achieve higher academic success. This points out the fact that social and cultural resources have a big impact on their access (Facer & Furlong, 2001).

In accordance to Bennett et. al. (2008), Cheong (2008), Sherry and Fielden (2005), Livingstone and Helsper (2007) and Facer and Furlong (2001), this article aims to problematise and question some of the stereotypes about the 'Net generation'.

### **Conceptualisations of the 'Net generation'**

Tapscott (1998) was one of the first to identify the new generation growing up surrounded by digital media. He calls this new generation the 'Net generation.' He explains further that being surrounded by digital media has made the 'net geners' so used to it, that "digital technology is no more intimidating to them than a bread toaster" (Tapscott, 1998, p.1). He argues that the 'Net generation' is the first generation to be more comfortable, knowledgeable and literate than their parents, teachers and other adults. According to Tapscott, this is because it is easier for children to learn how to use new technology since they are more familiar with from birth. Children assimilate technology while adults must accommodate to technology, which is often a more difficult learning process (Tapscott, 1998, pp.36-42). Prensky (2001) presents a similar argument about the learning process of what he terms 'digital natives' and 'digital immigrants'. In accordance with Tapscott, Prensky labels the ones born with the new technology as 'digital natives'. They are seen as being fluent with the digital language of technology. The digital immigrants must, on the other hand, learn to adapt to the new technology in a similar way an immigrant learns a new language (Prensky, 2001). Rosen (2007) calls this generation the 'My Space generation' defining them as being immersed with technology, and social networking sites.

According to Tapscott the oldest ones of the 'net geners' are today in their early thirty's (2009). The eldest of the generation turned 31 in 2008 and the youngest turned 11. Tapscott talks about a generation instead of life-stages because he claims that 'net geners' are different from older generations not only in using technology, but because their brains have developed differently (2009). Their brains process fast-moving images differently. To sum it up, the conceptualization of the 'Net generation' is mainly positive and highlights the generation gap by posing young people as technologically savvy, using the Internet for everything, for extended periods of time and from various places. Being techno-savvy for this group also means not being intimidated by technology

(Tapscott, 1998; Prensky, 2001). The ‘net geners’ are said to be using Internet to communicate with people all around the world. This includes contributing online content, finding information online and checking facts, while simultaneously being critical to the found information—because they understand online content can be manipulated. Entertainment, play and immediacy are also assumed to be very important to everything ‘net geners’ do online (Tapscott, 1998).

### **Analytical frames to discuss stereotypical techno-savvy images**

To be able to nuance and discuss the rather stereotypical images emerging from the conceptualisations of the ‘Net Generation’ above, the concept of Internet skills is introduced. These include several contiguous concepts - ‘Internet skills’ (Hargittai, 2005; Potosky, 2007) “digital skills” (van Dijk & Hacker, 2003), “Internet literacy” (Livingstone, Bober & Helsper, 2005) and “digital literacy” (Erstad; Eshet-Alkali & Amichai-Hamburger, 2004). Later the choice of the concept ‘Internet skills’ is explained, but first a brief review is provided to explain how these concepts are defined in the literature.

#### *Digital skills*

van Dijk and Hacker (2003) propose three different levels of digital skills; instrumental skills, informational skills and strategic skills. The instrumental skills refer to being able to operate hardware and software. Informational skills refer to a slightly more advanced type of Internet use, such as being able to search, select, process, and apply information using the hardware and software. The strategic skills, being part of highest skill level, refer to individuals being able to use the found information to improve one’s own social position in society (van Dijk & Hacker, 2003).

#### *Internet literacy*

Livingstone, Bober and Helsper (2005) provide a similar way of thinking about Internet literacy. They emphasize three skill levels for Internet literacy. These include knowing how to access the Internet, being able to understand and/or evaluate information and opportunities online and being able to create content by being an active producer and receiver of online content (Livingstone et. al. 2005). Some attempts have been made to measure what people can or can’t do on the Internet (Potosky, 2007; Hargittai, 2005). Usually these measurements are referred to as Internet skills. Potosky (2007) constructed an Internet knowledge measure (iKnow) containing questions about different Internet knowledge items. These included being able to construct a webpage, update virus programmes, designing a background and changing preferences on the computer.

#### *Digital literacy*

The concept ‘digital literacy’ is a wider concept that includes not only Internet skills (what people can or can’t do with the Internet). According to Erstad ‘digital literacy’ contains skills, knowledge and attitudes in using digital media to be able to master challenges in the learning society (Erstad, 2005). By this Erstad argues that digital literacy relates both to technological skills, how to operate the technology per se and to possessing skills regarding technology use to achieve personal or collective goals. The latter can also be compared to van Dijk and Hackers concept of strategic skills (2003).

It is not simple to define what is meant by the broader concept of ‘digital literacy’ and it is even harder to find a good way to measure it.

*Measuring Internet skills and self-efficacy*

As mentioned before, one way is to measure the 'Internet skills', another way is to measure self-efficacy by asking people how confident they are in using digital media. The individual's belief in her own ability to perform, or self-efficacy (Bandura, 1997) is equally important for the use of Internet. LaRose, Mastro and Eastin (2001) found that positive outcome expectations, Internet self-efficacy, and perceived Internet addiction were directly related to Internet usage. Negative outcome expectations, self-disparagement, and self-slighting were negatively related to Internet use. Torkezadeh et al. (2002, 2006) also found that an individual's belief in her ability to perform, also affects her performance. Torkezadeh and van Dyke (2002) followed 189 students before and after computer training. They found that both male and female respondents benefited from training and improved their self-efficacy scores for all factors.

In this article the focus will be on Internet skills and self-efficacy in order to explore the relation to the concept of the techno-savvy 'Net generation'. A lot of the concepts of 'Net generation' are about the Internet use and this paper deals with Internet use as well.

## Method

This study is based on data collected in an annual Swedish national survey about Swedish peoples' Internet use. It is a component of the international World Internet Project ([www.worldinternetproject.net](http://www.worldinternetproject.net)). The survey was conducted between February and April 2008. A representative random sample of 2,266 people from around Sweden from the age 12 years old answered a wide range of questions about their Internet use. Two different surveys were conducted, one with respondents 16 years and older and one with young people from 12 to 16 years old. The main reasons for conducting two different surveys were that people younger than 16 needed their parents' permission to participate, hence the methods performing the telephone interviews were a little bit different for the two groups. Since we had to speak with parents to respondents younger than 16 years old, we asked the parents a few questions about the access to the Internet in their home, about their own Internet use and about their children's Internet use. We also asked respondents older than 16 if they have children. For the ones that had children, we asked what their children mostly do when using the Internet and how often their children used the Internet. Most of the results in this article are based on respondents from 12-30 years old. In Table 1 we can see the sample sizes for four age groups which 12-30 year olds were divided in.

Age	N
12-16	211
17-20	178
21-25	146
26-30	179
Total	714

Table 1: Sample sizes for different age groups

The group of 12-30 year olds are referred to as the 'Net generation'. In an attempt to explore generational differences, the group of 12-30 year olds were compared to 32-50 year olds (N=672). Non-parametrical tests were used to analyse the generational differences, but also the effect on Internet skills and self-efficacy by age and gender.

In order to explore the stereotypical images of the techno-savvy 'Net generation' the following questions were used about Internet skills:

- Do you know how to use the following things on the Internet? Send an email? Attach documents to your email? Download music? Make a voice-call online? Set up a server?

The question about self-efficacy was:

- How competent are you when it comes to using the computer? Not competent at all, not that competent, fairly competent or very competent?

The five Internet related items regarding Internet skills were then summarized into an index to represent the Internet skills scale. Low values on the scale indicated poor Internet skills, while high values indicated good skills. When it came to internet use, some of the questions asked were about using the Internet for communication (instant messaging, chat rooms, make voice calls and send emails), information (look up the meaning of a word, searching facts, search information to school related work) and entertainment (listening to /downloading music, playing games, watching /downloading videos, watching TV online and listening to online radio). The answers were measured through a six-grade scale (never; occasionally; sometimes per month; sometimes per week; once a day; several times per day). In order to measure regular activity, the weekly and daily users were coded as 1 and occasional users and non-users were coded as 0. All the activities belonging to the different themes such as communication, information, and entertainment were made into indexes on the same theme. Further an index on web 2.0 activities was conducted based on two questions, "Do you have a weblog?" and "Are you a member of a social networking site online?" This index had only three values, 0, 1, 2. The lowest value (0) indicated non-activity in web 2.0 related activities while the highest value (2), indicated high-engagement in web 2.0 related activities since both weblogs and social networking sites were used.

## Results

The results in this paper focus on what 12-30 year olds do online and their knowledge when it comes to using the Internet. This included how they perceived their competence in using computers. The aim was to analyse the data from a Swedish national representative survey regarding peoples' Internet use and compare the results to the stereotypical images of techno-savvy 'net geners', in order to nuance the images. Interpreting the conceptions of 'Net generation' within the dataset used in this article, the following stereotypical images were questioned:

- Are all 'net geners' Internet users?
- Do all 'net geners' use the Internet in a similar way?
- Are there any generational differences between the 'Net Generation' and an older generation when it comes to Internet behaviour?
- Are the 'net geners' relying more on the Internet and abandoning traditional media?
- Do 'net geners' use the Internet from various places?
- Is the 'Net generation' techno-savvy?
- Is the 'Net generation' also the 'MySpace generation'?

*Are all 'net geners' Internet users?*

The basic assumption for the stereotypical images of 'net geners' is that they are Internet users (Livingstone & Helsper, 2007; Lenhart, 2005). In Sweden, the proportion of non-users 12-30 years old is 2.5 percent (n=18). 3.5 percent don't have Internet access at home (n=25), 2.7 percent (n=12) don't have access in school and 19.6 percent (n=42) don't have access at work. Overall only 1.5 percent (n=11) lack access at home, in school or at work (depending on the occupation). Among Internet users there are few low users. Among those who have Internet access at home there are 7 percent (n=47) low users, meaning they use the internet only a few times per month or even less. 24 percent (n=102) of the students and 16 percent (n=27) of the working people are low users. However, when taking all three places for Internet use into consideration, the non-users and low users make up for 8 percent altogether (n=58). When comparing this to Livingstone and Helsper's (2007) study in the UK, the low-users in the UK correspond to 13 percent of the children aged 9-19. However it is also shown that Internet use increases with age and that might be the explanation to the lower proportion of occasional users in Sweden, in comparison to the UK (the youngest ones in the Swedish sample are 12 years old). In accordance to other studies (Livingstone & Helsper, 2007; Lenhart, 2005) the proportion of non-users is about 3 percent.

A lack of interest seems to be the main reason not to use the Internet. However, many respondents, when asked about their lack of usage, have answered 'don't know'. It is hard to say if there might be some other reasons for non-use. The 'no interest' answer might have been interpreted as a socially undesirable answer and the 'don't know' answer was therefore chosen. Facer and Furlong (2001) identified a group of young people that constructed their own values regarding technology/computer use that diverges from the dominant image of the 'Cyberkid'. These children argued that the computers were not important for them in their daily activities. Some argued that computer use is not healthy, that they rather be outside engaging in physical activities. However this construction was not unproblematic. Some of the children were concerned that they should not have felt the way they did about computer use and some of them expressed the idea that their own children won't have to face the digital inequalities because they are going to be born into the digital society (Facer & Furlong, 2001).

	Frequency	Percent
No interest	5	31
Don't know	9	56
No answer/other reason	2	13
<b>Total</b>	16	100

Table 2: Non-users answers regarding the reasons to not use the internet (16-30 year olds)

*Do all 'net geners' use the Internet in a similar way?*

According to Tapscott (2009) young people aged 11-31 are the 'Net generation'. That statement suggests that all 11-31 year olds are using the Internet in a similar way because they belong to the same generation. In an attempt to explore this stereotypical image of the 'Net generation,' the Internet use for communication, information and entertainment were compared between four age groups (12-16; 17-20; 21-25; & 26-30 year olds). The younger age groups (12-16 and 17-20 year olds) are frequent users of instant messaging (61% - 72% daily users). However the older age groups (21-30 year olds) are more active when it comes to using email (26% of 12-16 year olds and 47% of

17-20 year olds are daily users compared to 74% of 21-25 year olds; 77% of 26-30 year olds are daily users). Communicating through chat rooms and making voice-calls is rather unusual for all age groups (Chat room  $\geq$  53% non-users and voice-calls  $\geq$  70% non-users). When it comes to using the Internet for information searching it seems that using the Internet for school related work increases by age (12-16 year olds = 6% daily users; 17-20 year olds = 14%), when examining young people that attend school. The entertainment oriented Internet use also differs in some respects between age groups. The youngest (12-16 year olds) are the most frequent game players (26% daily users), 17-20 year olds are the most frequent users when it comes to downloading music and listening to music (32% daily users) while the older age groups 21-25 and 26-30 are the most frequent listeners to online radio (21-25 year olds = 29% daily or weekly users; 26-30 year olds = 19% daily or weekly users).

*Are there any generational differences between the 'Net generation' and an older generation when it comes to Internet behaviour?*

As stated before, 'net geners' are expected to have a different relationship with information and communication technology in comparison to older generations (Tapscott, 1998; Prensky, 2001). To be able to say something more detailed about these perceived differences, non-parametric Mann-Whitney tests were performed. The activities were categorized by communication, information and entertainment. Using these themes, indexes were constructed. The communication-index consisted of activities such as instant messaging, chat rooms, voice calls and email. The information index was about searching for facts and looking up a meaning of a word, and finally the activities regarding the entertainment online such as listening to music and watching TV online were summarized into an entertainment index. Further, an index of web 2.0 activities was also conducted. These included the use of weblogs and social networking sites online. Each activity was coded as 0 for not using the activity at all or using it occasionally and 1 for using it regularly which is weekly or daily. The activities regarding web 2.0 were dummy variables from the beginning (0=No; 1=Yes) and should be interpreted as use/non-use. The values in each index could vary between 0 for not using any of the activities regularly to the maximum amount of activities that were included in the index. The 'Net generation', here in accordance to Tapscott defined as 12-30 year olds, was compared to an older generation, which include both 'baby boomers' and 'gen Xers' (32-50 year olds). The two groups were compared regarding the regular use of communication, information and entertainment online.

The results show that the communication activities vary between the two generations ( $Z = -13.382$ ) as well as within the 'Net generation' ( $Z = -2.338$ ) though the differences within the 'Net generation' are not as distinct as between the two generations. The differences within the 'Net generation' are significant on a 95% confidence level while the differences between 12-30 year olds and 32-50 year olds are significant on a 99% confidence level. The reason for this could be explained by the high adoption of email in all age groups, while instant messaging and chat rooms usages were mostly used among the younger people. However, instant messaging also varies within the 'Net generation' because the younger group (12-20 year olds) is using it to a higher extent than the older group (21-30 year olds). The information- and entertainment-activities don't seem to be specific for the 'Net generation' because the differences within the 'Net generation' are considerable as well as between the generations (see table 3). Some of the activities in the 'entertainment index', like games for example, were mostly used among the youngest (12-16 year olds) and some of the activities such as watching TV online were hardly ever used, which could explain the variation within the 'Net generation'. The web 2.0 activities described here are defined

as using weblogs and social networking sites, by the 'Net generation' in a higher extent than the comparing age group (32-50 year olds) (Sig=0.209 within 'Net generation').

	Mann-Whitney U	Wilcoxon W	Z	Sig. (2-tailed)
<b>1. COMMUNICATION</b>				
1.1 Between the generations	126701.5	312446.5	-13.382	.000
1.2 Within the 'Net generation'	53748	102889	-2.338	.019
<b>2. INFORMATION</b>				
2.1 Between the generations	173201	357122	-6.068	.000
2.2 Within the 'Net generation'	52933.5	101761.5	-2.587	.000
<b>3. ENTERTAINMENT</b>				
3.1 Between the generations	131735.5	315656.5	-12.086	.000
3.2 Within the 'Net generation'	50689.5	99517.5	-3.321	.001
<b>4. WEB 2.0</b>				
4.1 Between the generations	118811	302126	-15.282	.000
4.2 Within the 'Net generation'	55498.5	103703.5	-1.255	.209

Table 3: Comparisons in regular use of Internet activities between the 'Net Generation' and an older generation (32-50 year olds) as well as within the 'Net Generation'

*Are the 'net geners' relying more on the Internet and abandoning traditional media?*

Table 4 shows the average time per week spent using the Internet, watching television, listening to music and radio (not through the Internet) and reading newspapers and magazines. According to the stereotypical images of 'Net generation', young people are turning to Internet for everything, meaning that they are abandoning more traditional media. The time 17-30 year olds were spending with Internet in an average week was perceptually higher than the time they spent consuming traditional media. They spent almost twice as much time using the Internet as watching TV. On the other hand, the Internet is not a medium specifically limited to one age group. Since even the oldest in this analysis (36-45 year olds) are spending the most hours using the Internet when compared to other media. The youngest age group, 12-16 year olds, was spending less than 15 hours per week with the Internet which is 2 to 8 hours less than the other age groups. According to Tapscott (2009), the youngest ones should be immersed with technology and using the Internet in a much greater extent than the previous generations. This doesn't seem to be the case for the 12-16 year olds. They are also reading books and magazines, watching television and listening to music approximately the same amount of time as other age groups, which means that they are not abandoning traditional media.

Age	Newspapers and magazines	Music and radio	Television	Internet
12-16	1 h, 47 min	10 h, 40 min	11 h, 38 min	14 h, 44 min
17-20	3 h, 26 min	14 h, 4 min	9 h, 58 min	20 h, 12 min
21-25	3 h, 24 min	13 h, 41 min	12 h, 44 min	23 h, 18 min
26-30	3 h, 30 min	14 h, 25 min	12 h, 20 min	20 h, 11 min
31-35	3 h, 48 min	18 h, 42 min	12 h, 54 min	18 h, 30 min
36-46	4 h, 22 min	15 h, 28 min	13 h	16 h, 10 min

Table 4: Average time per week spent with different media

The majority of 12-30 year olds are daily users (12-16 year olds =78%; 17-20 year olds =84%; 21-25 year olds =85%; 26-30 year olds = 81%) but the time spent online varies within age groups. 12-30 year olds are using the Internet approximately 3 hours daily at home. Between 29 and 41 percent of 12-30 year olds are spending one hour or less with the Internet daily in their homes (See Table 5). The heavy Internet users (those spending five hours or more online daily in their homes) are generally from the 17-20 and 21-25 year olds.

Age	1 hour or less daily at home, (%)	More than 1 hour and less than 5 hours daily at home, (%)	5 hours or more daily at home, (%)	Total N
12-16	40	52	8	205
17-20	29	60	11	170
21-25	34	50	16	145
26-30	41	50	9	168

Table 5: Time per week spent online

*Do 'net geners' use the Internet from various places?*

Using the Internet at other places than the home, such as relatives or friends houses, and public places, such as libraries and internet cafés, is not very common and the time spent online in these places is very low. Average time spent with Internet at friends' and relatives' houses is up to 30 minutes per week (for 12-16 year olds). At public places the weekly Internet use is almost nonexistent. 12-16 year olds and 21-25 year olds spend approximately 3 minutes per week using the Internet at public places. 26-30 year olds spend 4 minutes and 17-20 year olds spend approximately 12 minutes per week online at public places. In accordance to other studies, the home and school are the primary places they access the Internet (Hasebrink, Livingstone & Haddon, 2007).

When it comes to using the Internet in school we could only compare the two youngest age groups 12-16 and 17-20 year olds. The proportions of students in the older age groups were too small to be used in a statistical analysis. The average time spent online in school is 68 minutes per week for 12-16 year olds and 253 minutes or

approximately 4 hours per week for 17-20 year olds. The reason is that a much larger proportion of 17-20 year old students are using the Internet daily (45%) in comparison to the 12-16 year olds (7%). One explanation could be that 93 percent of 12-16 year olds who have Internet access in school say that there are rules about what they can and can't do online when they are in school and 61 percent of the same cohort report that they are not allowed to use the Internet during breaks. However the proportion of non-users are small (12-16=9%; 17-20=4%), including those who do not have access to the Internet in school. Even though the proportion of non-users is small, the school doesn't seem to be the arena for 12-16 year olds to take up opportunities online. It doesn't seem to be an opportunity for low Internet users at home to be using the Internet more in school. The relationship between time spent online at home and time spent online in school is positive both for 12-16 year olds ( $R=0,321^{**}$ ) and 17-20 year olds ( $R=0,233^{**}$ ). The more time they spend online in their homes, the more time they spend online in school. This is similar to Facer and Furlongs (2001) findings about those who have computer access at home; they report these individuals are more likely to take opportunities to use computers in other places such as the school or friends' houses.

*Is the 'Net Generation' techno-savvy?*

In order to explore the extent of how techno-savvy the 'Net generation' is in regards to their usage, the aspect of self-efficacy on computer use and the aspect of Internet skills were used. For self-efficacy in computer use the question, "How competent are you when it comes to using the computer?" was examined. The majority saw themselves as fairly or very competent when it comes to using the computer (12-16 year olds = 88%; 17-25 year olds = 86%; 26-30 year olds = 83 %). Few said that they were not competent at all (1% -2%). But a rather large proportion thought that their competence in using computers was not that good (11% - 17%). When looking at the low- and non-users separately, we could see that the proportions of those perceiving their competence as low is higher comparing to the total sample (12-30 year olds). 12.5 percent of the low- and non users said that they are not competent at all when it comes to using computers.

	Frequency	Percent
<b>Not competent at all</b>	7	12.5
<b>Not that competent</b>	15	27
<b>Fairly competent</b>	32	57
<b>Very competent</b>	2	3.5
<b>Total</b>	56	100

Table 6: Self-efficacy among non-users and low-users (12-30 year olds)

In previous studies it is shown that Internet skills and self-efficacy vary both by gender and age (Livingstone et. al. 2005). A Kruskal-Wallis test was performed both on Internet skills and self-efficacy. The age was tested for four different age groups (12-20; 21-30; 32-40; 41-50). The results show that gender ( $Chi2=131.055$ ) and age ( $Chi2=37.012$ ) are both significant on 99 % confidence level for the differences in internet skills as well as in self-efficacy (gender  $Chi2=53.863$  and age  $Chi2=57.786$ ). However, within the 'Net generation', the differences are not so big (for internet skills within 'Net-generation'  $sig=0.057$  and self-efficacy  $sig=0.249$ ), which means that the age

could not explain the variation in Internet skills and self-efficacy within the group of 12-30 year olds. The youngest in this group, 12-16 year olds, stand out because there was no gender differences found concerning self-efficacy or Internet skills. For the 17-30 year olds the self-efficacy tends to decrease for females ( $R=-0,269^{**}$ ). 12-16 year olds stand out for one more reason. When examining the Internet skills it is shown that they score lowest on the Internet skills-scale containing five Internet use items (email, attach documents to email, download music, make voice-calls and set up a server). The Internet skills seem to increase by age ( $R=0,143^{**}$ ) within the group 12-30 year olds. 13 percent of 12-16 year olds scored 1 or lower and only 2 percent of 17-30 year olds scored 1 or lower on Internet skills. This is similar to the findings in a study by Sherry and Fielden (2005) where they found that the Millennial cohort is not as competent with computers as they are confident. The basic Internet skill seems to be using the email since almost all of the respondents scoring 1 answered that this is the one thing they know how to use. There were no statistical significant differences found when it comes to socioeconomic factors. It would have been expected to find differences among young people who are still living at home, however the socioeconomic differences in Sweden might be smaller comparing to for example the UK or the USA where other statistical surveys on young people's Internet use were performed (UK Children Go Online, PEW Internet and American life project). The notion of 'Net generation' doesn't focus on social differences among young people, though it is shown in several studies, as in this, that gender and age have impact on the confidence in using computers and the Internet (Lee, 2008, Torkzadeh et. al. 2006, Livingstone et. al.2007).

*Is the 'Net generation' also the 'MySpace generation'?*

Another stereotypical statement or image is that the 'Net generation' also is the 'MySpace generation' (Rosen, 2007). As shown before the web 2.0 activities such as use of weblogs and communities seem to characterize the so-called 'Net generation'. In Figure 1 we can see the proportion of community users and weblog users among different age groups. As pointed out before, the use of social-networking sites and weblogs decreases with age. However, it is important to notice that writing weblogs isn't that usual (11-17% users) even among the 'net geners' and when it comes to the social networking sites there are a lot of non-users in the younger age groups (33-50% non users) even though the proportions of users are significantly higher comparing to older age groups. This would mean that even though the image of the 'net geners' as web 2.0 users appears to be true when comparing to an older generation, there still are a lot of non-users. In fact, when it comes to weblogs there are more non-users. This, I would argue, is a way of exaggerating the proportion of use in social networking sites and weblogs, and ascribing the 'Net generation' such characteristic.

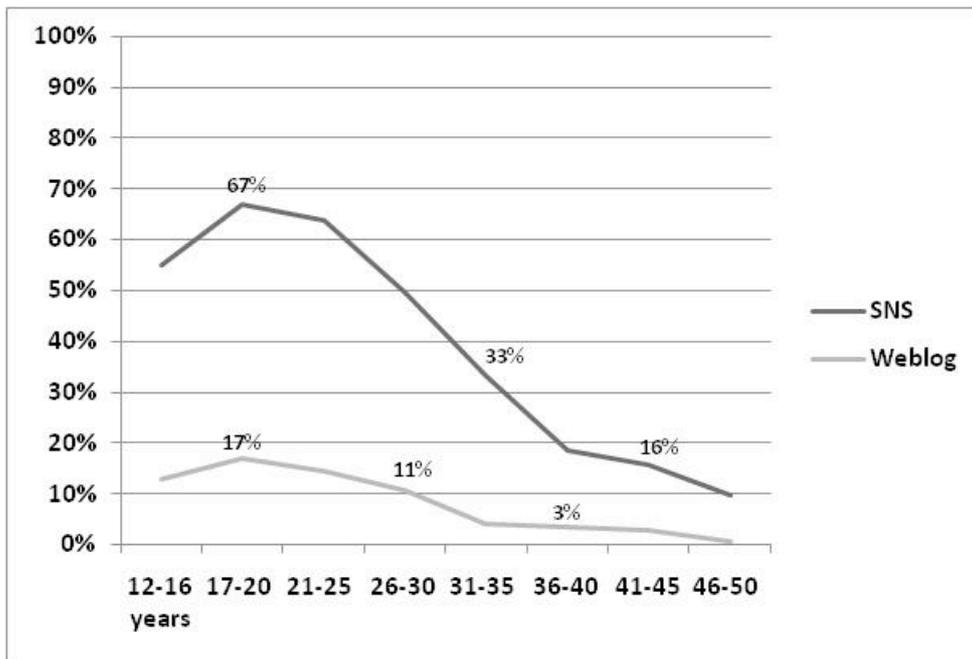


Figure 1: Use of social networking sites and weblogs (12-50 year olds)

## Conclusion

Using a representative study about Swedish people's Internet behaviour some of the stereotypes of 'Net generation' were explored by framing them as questions and analysing each question through the data. The main conclusions drawn from the results presented are that it is too simplified to talk about a 'Net generation'. This article implies that several of the stereotypical images about the 'Net generation' can be nuanced. In the sense of using the Internet it could be argued that a 'Net generation' exists since almost all of the 12-30 year olds are using the Internet. However, the Internet adoption is generally high in Sweden and the majority of non-users are older than 60 years. It is therefore not enough to state that there is a 'Net generation' just because the age group defined as the 'Net generation' is using the Internet. There is an assumption about the similarity of Internet use as unifying factor for the 'net geners'. In accordance to previous research findings (Livingstone et. al., 2005, 2007) it is found that Internet usage differs between age groups. Livingstone et. al. (2005, 2007) has shown that older children spend more time online and become more skilled at using the Internet. They also show that the youngest age group (12-16 year olds) do not spend as much time with the Internet as their older cohorts in the 'Net generation'. Gender differences were also found in accordance to previous studies (Livingstone et. al., 2007). This means that social factors such as age and gender can't be excluded from the discourse about young people's Internet use. They are important for explanation in variance of young people's Internet use.

Another important issue emerges in relation to the fact that some young people perceive their competence in using computers or technology as low. An uncritical assumption is that all 'net geners' are equally competent in using the information and communication technologies. Although the vast majority of 'net geners' are Internet users and think of themselves as fairly or very competent in using computers, it doesn't mean that they all use the Internet in the same way and are equally competent. This was found to be the case for the youngest age group (12-16 year olds) in comparison with older cohorts. 12-16 year olds scored rather high on self-efficacy-measure and not so

high on Internet skills. The most likely explanation is that the Internet skills-scale did not succeed to measure the youngest age group's skills (it is possible they would have scored higher on the Internet skills if they were asked about activities they frequently engage in). This finding questions the stereotypical image of 'techno-savvy' 'net geners' because it could be interpreted that the youngest ones do not necessarily know more when it comes to using the Internet. It could be that they just know different things. It is also interesting that no gender differences were found among 12-16 year olds concerning self-efficacy and Internet skills. Further research needs to be done in order to explore when and why men and women start to feel differently about their competence in using computers and the Internet.

When it comes to the generational differences for the Internet activities analysed in this paper it is shown that very few Internet activities can be ascribed to the 'Net generation'. Only for web 2.0 activities a generational difference was found between the 'Net generation' (12-30 year olds) and the older generation (32-50 year olds), implying that the 'Net generation' could be characterized as a 'MySpace generation'. However, writing weblogs is not that common even among the 'net geners' and the use of social networking sites is not as great as it could be expected, which means that such a characterisation would exaggerate the importance of web 2.0 related activities for the 'net geners'. This is why it is important to explore and try to nuance the stereotypical images of 'Net generation' in an attempt to try to avoid ascribing certain qualities to the so-called 'Net generation'.

The diversity of Internet use among 'net geners' on one hand and the consistency of self-efficacy in computer use on the other, indicates the complexity of the concept 'techno-savvy'. Since the Internet skills were not exhaustively measured it is not possible to say how techno-savvy the 'net geners' really are. However, as mentioned before we can not exclude the ones who do not find themselves as competent computer users, and we can't ignore the actual differences in Internet usage both when it comes to amount of time spent online and the usage patterns. This could result in many young people being left out of important and increasingly necessary educational opportunities to explore and become familiar with certain technologies in schools, especially if they do not have access at home. It is proposed that further analyses on measuring Internet skills are very important mainly for two different reasons; (1) in order to explore the stereotypical images and learn more about what people know when it comes to using the Internet and (2) to further explore who are the ones gaining advantage in the information society and who are those at risk of becoming excluded?

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