MEASURING ONLINE SKILLS OF DUTCH OLDER ADULTS: PERFORMANCE TESTS ON LAPTOPS AND TABLETS

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Specialization: New Media and Communication

Date: 21-07-2016

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Abstract
In light of the digital divide and older adults being at a disadvantage when it comes to Internet skills, we examined the differences in Internet skills of Dutch older adults (50+) on both laptops and tablets. Tablets sales have risen in the last few years and with its innovative type of interface, it would be interesting to see if this is the device that can shift older adults on the spectrum of digital inequality. In order to test the level of five types of Internet skills: operational, formal, information, communication and strategic and to examine what skill related problems they encounter on both devices, performance tests were conducted with 54 Dutch older adults between the age of 50 and 72. Results indicate that older adults show the same skillset on both devices apart from the operational Internet skill. Because of a lack of knowledge, saving a file remains problematic on a tablet. On the formal skill, older subjects on both devices showed a significantly lower skill level than younger subjects. For the information skill, age was only of influence on the level of skills on the tablet. Recommendations for future research are using a larger sample size with all demographic variables (age, gender, education) equally distributed among the sample size and also to focus on the communication skill, because of limited research available. This study showed great interest from this age group, but some aspects of SNS remain an issue.

Keywords
older adults, digital skills, tablet use, digital inequality

1. Introduction

No scientific study is needed to notice that many older adults show skills that need improvement when it comes to handling and working with ICT. But with the pension age being raised in the Netherlands and people getting older, the importance of this group participating in the digital society grows. That is also why this study focusses on older adults aged 50 years and over. This group has not reached their pension age yet and still needs to participate in a (often) digital workplace environment. From work by Friemel (2014) we can deduce that working environments where older adults need to work with ICT can facilitate the Internet adoption of older adults. Not being able to work with the Internet is a huge disadvantage for this group compared to younger generations. The younger generation, that Prensky (2001) calls 'digital natives', because of their upbringing with technology all around them, are at the other end of the older adults on the digital divide spectrum. This digital divide explains the inequalities between different groups of people (van Dijk, 2012). Does that mean that older adults can never become a digital native? Not necessarily. Even though younger people use the Internet for all sorts of activities, Helsper (2010) found that the generation one is in is not the only significant predictor for being a digital native. Gender, experience, education and the breadth of Internet use is also of influence. This means that one can certainly become a digital native even though they are in an older generation. This is positive in light of the digital inequality that exists.

Since gender and educational level are fixed, one can only try to improve the breadth of Internet use and therefore ones experience. With this, a problem arises. Basic knowledge of the Internet and its possibilities are where older adults get stuck in navigating through this digital world. Research by van Deursen and van Dijk (2011) showed that older adults often do not how to manage a computer and how to navigate through the system. This puts them at the other end of the spectrum of the digital divide. But when they do possess these vital skills, they can perform better than the younger generation. So in fact, if these older adults have a way of learning the basic skills, they can be a true asset in a company and outperform the younger employees on a digital level.

All this research is based on older adults using a computer. Would they show the same skillset if they were to use the Internet on a different device? Tablets have risen in sales over the past few years (Hischier and Wäger, 2015). Tablet's innovative type of interface has provided people with more intuitive ways to control a device (Jayroe and Wolfram, 2013). Modern day advanced tablets can compete with many computers or laptops and their portability and size are much desired features. Older adults are very interested in using technology (Gitlow, 2014; van Dijk and van Deursen, 2014). They mostly want to know what their friends and family are up to (Rogers, 2009 in Gitlow, 2014). But what they might not realise is that having sufficient skills can benefit them in every aspect of their life and even be positive for their position in the digital divide spectrum. Research by Werner, Werner and Oberzaucher (2012) has shown that a tablet can even reduce the lack of confidence that older adults often have with new technologies. Using a tablet makes them feel more competent and the simple use of it stimulated them to learn more about other features available on the device.

So with a tablet, the insecure and computer illiterate middle aged worker has the possibility to turn into a self-assured employee that knows how to get things done.

Van Dijk and van Deursen (2014) show a somewhat sceptical view on this from the perspective of users that are already accustomed to the ways in which a computer or laptop works. They argue that navigation and orientation might be more difficult since tablets have smaller screen sizes. Müller, Gove and Webb (2012) in van Dijk and van Deursen (2014) bring up the point of data entry. Many users are challenged by the way data has to be entered. This could lead to a drop in sales among users that want a tablet for more than just entertainment and leisure purposes. Luckily, the industry has a reply to it, there are many wireless keyboards available that work on Bluetooth and there are also many different screen sizes available. This makes the comparison to a laptop or a computer easier. On a positive note, menu structures look different on tablets and having a mobile website or an app is almost becoming a necessity if you want to compete in the online world nowadays.

Concluded, there are many advantages and disadvantages when it comes to replacing a computer or laptop for a tablet. Tablets seem easy to use and come with excellent specifications. On the other hand, they do not seem to be that user friendly in some situations and battery life of these devices remain an issue. Technology industries are trying hard to find solutions for this by creating adaptable accessories. This study can also contribute to the understanding of Internet skills of older adults on different devices. Will their Internet skills be higher on a tablet or won't they? With the knowledge of this group's Internet skills over multiple devices, policymakers and governments can create programs specifically aimed at their weaknesses. Therefore the main purpose of this research is to fill the research gap of Internet skills on different devices and to contribute to a better understanding of older adults' Internet skills on both a computer and a tablet.

2. Theoretical framework

2.1 Digital inequality

Digital inequality is a phenomenon that has gotten considerable attention over the last few years. It describes inequalities in four types of access to the digital world: motivation, physical access, digital skills and different usage (van Dijk, 2012). Van Dijk (2012) argues that the inequalities have been mostly described in literature as demographics or a difference in access or usage. Older adults seem to play a big part in this. Due to all kinds of barriers: physical, economic or psychological, this group will probably experience inequalities in the use and access of technologies (Smith, 2014). For example, Internet penetration rates are higher among younger adults and this divides the younger generation from the older one (Chen and Wellman, 2003). Norris (2001) explains that there is a key generational difference between older adults and the younger generation, the digital natives (Prensky, 2001) and that this generational difference is the reason that many older adults have issues with adapting to the Internet and using it. Their slow pace in adapting ICT is not beneficial either. Taken in mind that the population in developed countries is aging (Shresta, 2000) and that the uptake of ICT by older adults is falling behind (Czaja and Lee, 2007), other steps need to be taken in order to narrow down the digital divide.

Proper explanations for these inequalities in between generations are hard to find since this field of research is often conducted through surveys and has not been tested in experiments. Research on the digital divide has gone from solely focussing on physical access to the other types of access, like skills or different use. Hargittai (2002) calls this the 'second level digital divide'. Specifically older adults, a group that has not been brought up with ICT all around them, are at a disadvantage because they have trouble working with ICT. Digital skills are needed to compete in the world nowadays. They are a key factor in broadening or minimizing the digital divide. For example, with phone books not available anymore, calling an acquaintance might become an issue if you cannot use the website to find the number that you had lost. Asking family members to find it for you puts pressure on them. Therefore, it would be best to have older adults acquire sufficient skills so they can build on their self-reliance on the Internet. They are the fastest growing group of Internet users (Hart, Chaparro and Halcomb, 2008) and show potential. But this is not as simple as it seems. Hargittai (2002) argues that the distribution of ICT skills and knowledge of ICT is unequal. Subsequently, some groups fall behind because of this. Older adults will be able to participate more in society and feel less isolated if they are provided with all kinds of resources like social media, e-mail, forums to share their hobbies on and Google to find information fast. With this, their quality of life can be improved in many ways (Winstead et al., 2013).

2.2 Digital skills

In this study, one type of digital inequality is being studied as the dependent variable: digital skills. Digital skills are the skills that are required to browse the Internet. The level of skills people show when browsing the Internet is very diverse. There are people that show a high level of skills and many people that show poor skills. To categorize these skills for use in

research, van Deursen (2011) created four kinds of skills initially: operational, formal, information and strategic skills. They describe your basic skillset, your navigation skills, your information-seeking skills and your skills to use the Internet to improve your own situation (e.g. book a cheap trip online instead of with an expensive travel agent). The interest in using the Internet is there, because older adults are very interested in using technology to keep up with their family and friends (Gitlow, 2014). With the rise of social media and people nowadays being even more networked with each other, a fifth type of skill should be added to make the measuring of Internet skills complete: the online communication skill (van Deursen and van Dijk, 2009a; Jenkins, 2006 in van Deursen, Courtois and van Dijk, 2014). Since many older adults become very active in social media to see how family is doing (Bell et al., 2013), this fifth skill can be interesting to take into consideration in this study. A satisfactory level of communicative online skills can be a true asset in the world of digital engagement for older adults.

Naturally, the younger generation grew up with the rise of the Internet. Therefore, a rational deduction would conclude that they have a better skillset than for instance their parents or grandparents, who did not grow up with technologies emerging all around them. Van Deursen and van Dijk (2011) mapped the Internet skills among the Dutch population. The research unveiled a difference in skills among Internet users: older adults score lower on operational and formal skills than younger people. That means that they have trouble with knowing how to get somewhere on the Internet and navigating through a websites subsections. Such a difference in skillset between several groups of the population is only broadening the digital divide. On the bright side, older adults do not perform poorly on all skills. Van Deursen and van Dijk (2009b) showed in previous research that older adults do show a higher level of strategic and information Internet skills once they have sufficient operational and formal skills. That means that they do know how to search for and select information from a webpage and that they would know how to use that information to their own personal benefits. If older adults were to obtain sufficient operational and formal skills, they could very well outperform younger people. It would be interesting to see if the intuitive nature of a tablet (Jayroe and Wolfram, 2013) reinforces these claims. Having older adults use tablets to their full extent would be valuable for themselves, but also for society. This could cause a change in the social relationships among older adults (Sum, Mathews, Hughes and Campbell, 2008) and they would be able to participate instead of staying behind.

2.3 Computers versus tablets

Many older adults feel uncertain about how to use certain technologies. Jobling (2014) wrote a paper about a campaign to make older adults feel more comfortable about using technology. They are often afraid that the problems they encounter will cause the entire system to fail. Jobling (2014) concluded that it was possible to teach this specific group of people sufficient skills. In line with research by Mayhorn, Stronge, Collings McLaughlin and Rogers (2004) trainings need to be focused on one task and participants will need sufficient time to complete tasks. Jobling (2014) argues that most of the target group does not even know what is possible on the Internet, so it is best to start with tiny steps in order to make them understand the possibilities. Once the trainings have been successful, older adults can

become large players in the world of digital engagement. They just need some guidance to get there.

Talking about taking tiny steps as Joblin (2014) argued might not be that applicable to using a computer. With a screen, a keyboard and a mouse, there are many operational problems that might arise for this age group. At this point we are not yet talking about Internet skills, but general skills and knowledge needed to operate a device. They would have to know what buttons to press and how to open or install programs. Tablets or smartphones generally have a simplified look that could be easier to learn for older adults. They have less buttons and use a more simple and intuitive operating system that would seem easier for them to use (Jayroe and Wolfram, 2013). Jayroe and Wolfram (2013) found that participants did not find a task to be more difficult on a tablet compared to a task on the computer. They felt confident in overcoming some challenges, like the size of the screen and the lack of a tactile keyboard once they had acquired sufficient experience in using the tablet. This means that older adults seem to have a positive attitude towards using a tablet and are even positive about overcoming its difficulties. Also, perceived usefulness of a tablet and its enjoyment is positively related to tablet adoption (Hur, Kim, and Kim, 2014). But the most important thing is that the older adults actually use the device that is the most useful for them. They need to feel comfortable in using a device and the amount of errors need to be as low as possible. In an experiment by Gauvin, Granger, Lorthiois and Poulin (2012), older adults were free to use a personal computer, a laptop or a tablet and could receive support when needed. Older adults without or with little experience with personal computers, preferred to use a tablet because of its portability and convenience. This shows that older adults show a great deal of interest in this technology and that they are willing to use it over other devices for several reasons.

The actual use of tablets among older adults is already rising. There are many older adults that have purchased tablet computers over the last few years. Because of the multi-touch interactions and fast processing speeds, tablets are quite interesting to older adults (Harada, Sato, Takagi and Asakawa, 2013). Even older adults with disadvantages can benefit from the use of these devices. Lim, Wallace and Luszcz (2013) found that around half of the participants in their experiment that were suffering from dementia were able to use the tablets without any difficulties. If these older adults with disadvantages can work with tablets, all older adults should be able to use tablets without encountering too many problems. Research by Jones, Kay, Upton and Upton (2013) supports that view just like research by Tsai, Shillair, Cotten, Winstead and Yost (2015). Tsai et al. (2015) found that older adults would buy a tablet for themselves after they had seen others use them or when it was recommended by others. They had no problems in learning how to operate the tablet. The lack of self-efficacy was not a barrier at all in using the tablet and using it made them feel more connected and content. They would recommend it to any other older adult.

The question arises whether or not tablets make Internet use easier for older adults. Research has shown that older adults show a positive attitude towards using one and some even prefer it over a computer because of its portability and convenience. The lack of a keyboard can be disadvantageous, but tablets can be connected with a keyboard via Bluetooth

or integrated within a case for extra convenience. Wright (2014) found that even though people could easily remember all the actions they had to perform on the touch screen with their finger (tapping/swiping etc.), it was not always as easy to perform these. Subsequently, touching the screen wrong could result in errors or screens changing. A stylus pen helped for some. These facts only acknowledge that many older adults need to know the basics in order to use to tablet to its full possibilities. All in all, research suggests that because of its extensive features, tablets can be a great asset for older adults in trying to participate in the society nowadays. They would only need to know the basics first. It would be interesting to see if the Internet skills differ on a laptop and tablet and which variables might be of influence on these skills. Little research has been conducted on the Internet skills of older adults on tablets. Therefore, we cannot make assumptions about whether or not older adults will perform better in the laptop or tablet condition based on earlier research. That is why we set up two general research questions to map the Internet skills of older adults on laptops and tablets (RQ1) and to map Internet skill-related problems that they experience when using laptops or tablets (RQ2).

RQ 1: What is the level of Internet skills of older adults when working on laptops and tablets?

RQ 2: What Internet skill-related problems do older adults experience when working on laptops and tablets?

3. Methodology

In order to test the level of Internet skills of the older adults, performance tests were chosen because of their high validity and in-depth view of human behavior (Litt, 2013). An experimental design was set up to measure the level of operational, formal, communication, information and strategic Internet skills when using a (1) laptop and (2) tablet.

3.1 Sample

In line with previous research (Hargittai, 2002), participants had to use the Internet at least once a month for more than e-mail purposes on both a computer and a tablet. Because the amount of older adults that use a tablet on a regular basis is not very large, convenience sampling was used to acquire participants. Older adults of age 50 and over were asked to participate in the study. Participants were recruited by the researcher herself by asking relatives and/or friends and family. The researcher also posted an appeal on Facebook asking people to participate in the study and contacted colleagues. Some participants asked their family members or friends to participate after they finished the performance tasks themselves.

A total of 54 people participated in the study, ages varied between 50 and 72 (M=58; SD=5.9; 59.3% female). They had an average number of 25.5 (SD=6.0) years of Internet experience on the computer and 2.8 (SD=1.8) years on the tablet. Participants spent more time a week on a tablet on average (M=9.0; SD=13.1) than on the computer (M=8.6; SD=9.9). Table 1 shows some characteristics of the participants.

Table 1. Characteristics of the participants.

	n	%
Gender		
Male	19	35.2
Female	35	64.8
Age		
50-55	16	29.6
55-60	21	38.9
60-65	11	20.4
70-75	3	5.6
Education		
Low (e.g., primary school)	7	13
Middle (e.g., high school)	28	51.9
High (e.g., college and university)	19	35.2
Marital status		
Single	4	7.4
Married or cohabiting (living together)	46	85.2
Divorced	4	7.4
Computer experience		
0 – 10 years	2	3.7
10 – 20 years	26	48.1
20 – 30 years	23	42.6
30 – 40 years	3	5.6

Tablet experience		
1 – 3 years	33	61.1
3 – 6 years	20	37
> 6 years	1	1.9
Computer use a week		
0 – 10 hours	40	74.1
10 – 20 hours	8	14.8
20 – 30 hours	4	7.4
30 – 40 hours	1	1.9
> 40 hours	1	1.9
Tablet use a week		
0 – 10 hours	37	68.5
10 – 20 hours	9	16.7
20 – 30 hours	6	11.1
30 – 40 hours	0	0
> 40 hours	2	3.7

3.2 Measures

Assignments were given to the participants following the research of van Deursen and van Dijk (2009a, 2011). The assignments were similar of nature to their research to ensure that validity and reliability of the experiment is up to adequate standards. They were adjusted to the specific population studied. Also, a pilot was conducted to ensure the validity, comprehensibility and reliability of the assignments. Five older adults were asked to review the assignments and explain whether or not they found the assignments understandable. All older adults argued that they had no problems with understanding the assignments and that they would be able to complete them as long as they possess sufficient skills. Therefore, none of the assignments were edited prior to performance tests. All of the assignments used in the study can be found in Appendix A.

3.3 Procedure

The performance tests took place between September 2015 and January 2016. The researcher visited the participants either at home or at their workplace. Participants were given a laptop that belonged to the university with an external mouse attached. For the tablet assignments, the participants either used a Nexus 9 (Android) or iPad 2 (Apple) depending on their experience with the operating system. This was decided to prevent any bias caused by the lack of knowledge of a different operating system. Future respondents were not informed about the exact purpose of the study to prevent bias, but they were given some information about what they are going to do in the invitation. Since convenience sampling may cause a low external validity of the study, the researcher tried to get an equal amount of men and women to participate and respondents of different age groups. The researcher visited 54 participants in order to conduct the experiments. Half of the participants (laptop condition) started doing the assignments on the tablet; the other half (tablet condition) started on the laptop. After completion of the tasks, they switch to the other device.

3.3.1 Performance tests

In order to save the actions of the participants, VLC media player (laptop) and Shou (iOS, Android) were used to record the screen of the device. The laptop was equipped with both Google Chrome, as well as Internet Explorer to ensure users could use a browser they were used to. On the tablet people could use either Google Chrome or Safari depending on the device. Browser history and cookies were deleted after every participant to prevent influence by actions of previous participants. Participants were not being encouraged by the examiner, but were reminded of the task if the examiner felt like they were somewhat lost. Participants were also free to tell the examiner if they felt like they cannot complete the task.

Participants were asked to perform five tasks on a tablet, five tasks on a laptop and to fill out demographic information with explanatory variables. Each task measured one of the Internet skills (van Deursen and van Dijk, 2009a; van Deursen, Courtois and van Dijk, 2014). Their framework where all the Internet skill tasks are based on is shown in Table 2. The outcome of every type of skill was defined by the completion rate. This completion rate was based on the successful completion of the entire task. If a task was not entirely completed, the respondent gave a wrong answer or did not even try to complete the task, the participant had failed the task. Tasks that were performed well and where respondents gave the right answer were coded as successfully completed.

Table 2. Conceptual definitions for Internet skills

Medium-related Internet skills	
Operational Internet Skills	*Operating an Internet browser, meaning:* • Opening websites by entering the URL in a browser's location bar; • Navigating forward and backward between pages using browser buttons; • Saving files on a hard disk; *Operating an Internet browser, meaning:* • Opening various common file formats (e.g., PDFs); • Bookmarking websites; • Changing a browser's preferences. • Operating Internet-based search engines, meaning: • Entering keywords in the proper field; • Executing a search operation; • Opening search results in the search result lists. *Operating Internet-based form, meanings:* • Using the different types of fields and buttons; • Submitting a form.
Formal Internet Skills	*Navigating the Internet, meaning:* • Using hyperlinks (e.g., menu links, textual links and image links) in different • Menu and website layouts. • Maintaining a sense of location when on the Internet, meaning: • Not becoming disoriented when navigating within a website;

	• Not becoming disoriented when navigating between websites; • Not becoming disoriented when opening and browsing through search results.
Content-related Internet skills	
Informational Internet Skills	*Locating required information by:* • Choosing a website or search system to seek information; • Defining search options or queries; • Selecting information (on Websites or in search results); • Evaluating informational sources.
Communication Internet Skills	*Communicating when on the Internet by:* • Searching, selecting, reaching and evaluating contacts online; • Exchanging messages online and exchanging meaning; *Attracting attention online;* • Constructing online profiles and identities; • Adopting alternative online identities for discovery or improvisation; • Pooling knowledge and exchanging meaning with others in peer-to-peer networking.
Strategic Internet Skills	*Taking advantage of the Internet by:* • Developing an orientation toward a particular goal; • Taking the right actions to reach this goal; • Making the right decisions to reach this goal;

3.4 Coding scheme

Subjects had encountered several Internet skill-related problems while performing the tasks. For example, some subjects experienced issues with defining a proper search query or double clicked the mouse even when this was not necessary. In order the map the occurrence of all these skill-related problems in both conditions and to interpret the rich video data (between 8–51 minutes per participant on one device) on a more detailed level, the Internet Skill framework by van Deursen and van Dijk (2009a) was used to code the data. This framework is based on the first four Internet skills and was extended with communication skill problems that were observed during the performance tests and some other problems that were observed in the data. The scheme includes 49 skill indices that are described at a general level of abstraction and can be found in Appendix B. Each video with the screen actions of the subject during the performance tasks was watched and along with the successful completion of the task, the skill-related problems in the coding scheme were registered. Some skill-related problems, like using the mouse or keyboard incorrectly in the laptop condition could not be observed by watching the videos. These were registered by the researcher herself during the performance tests.

3.5 Data analysis

In order to correctly answer the general research questions, independent sample t-tests were executed. To determine whether various demographic variables like gender, age or educational level are of influence on the level of Internet skills in both conditions, logistic regression analysis was used.

4. Results

4.1 Internet skill levels

As laid out in Table 3: in the laptop condition, 76% of the subjects completed the operational Internet skill task, 76% of the subjects completed the formal Internet skill task, 72% of the subjects completed the information Internet skill task, 52% of the subjects completed the communication Internet skill task and 63% of the subjects completed the strategic Internet skill task. The general results of the completed tasks in the tablet condition display that 46% of the subjects completed the operational Internet skill task, 69% of the subjects completed the formal Internet skill task, 70% of the subjects completed the information Internet skill task, 40% of the subjects completed the communication Internet skill task and 61% of the subjects completed the strategic Internet skill task.

Table 3. Successfully completed Internet skill tasks

Internet skills	Task completion		
	Laptop	Tablet	
	M (SD)	M (SD)	*T*-value
Operational task	0.76 (0.43)	0.46 (0.50)	3.284***
Formal task	0.76 (0.43)	0.69 (0.46)	.854
Information task	0.72 (0.45)	0.70 (0.46)	.211
Communication task	0.52 (0.50)	0.41 (0.49)	1.154
Strategic task	0.63 (0.50)	0.61 (0.49)	.196
Total	0.68 (0.279)	0.57 (0.304)	1.850

In order to determine whether or not there is a difference in performance between the tasks completed in both conditions, a t-test is performed for all Internet skill tasks. Results are shown in Table 3. A significant difference between the Internet skill scores on the laptop and the tablet was only found on the operational task. Subjects scored higher on the operational Internet skill task in the laptop condition (M=.76, SD=.43) compared to the tablet condition (M=.46; SD=.50). For the formal, information, communication and strategic task no significant difference was found. This means that there is no difference in how subjects in both conditions performed on the formal, information, communication and strategic tasks.

4.2 Individual skill related problems

By using a coding scheme, all possible problems that occurred during the performance tests were coded while watching all of the screen recordings from subjects in the laptop and tablet condition. In the following sections, the skill related problems that emerged will be discussed.

4.2.2. Operational skill problems

Table 4. Operational skill problems on laptop and tablet

Operational problems	Laptop		Tablet		
	N	%	N	%	Chi-square
1. Failing to save a file	7	13	29	53.7	9.974*
2. Failing to add website as bookmark	7	13	11	20.4	1.067
4. Not recognizing search engine	1	1.9	1	1.9	2.000
6. Using mouse incorrectly	11	20.4	0	0	12.247***

7. Experiencing issues with keyboard	0	0	3	5.6	3.086

*p<0.05 ***p<0.001

For 13% of the subjects in the laptop condition, it was impossible to save a file. They either did not know where to click or were misguided by the file extension (e.g. saving the entire webpage in html format instead of the picture). In the tablet condition, more than half (54%) of the subjects showed problems with saving a picture to the device. All of the subjects that failed this task later explained that they had no idea that a picture was saved by pressing it long enough for an extra window (save file) to appear. A Chi-square test showed significant difference between the number of problems occurring with saving a file in the laptop and tablet condition. Adding a website as a bookmark was an issue for 13% of the subjects in the laptop condition. Many of them did not know where to click and kept searching around the page until they gave up. In the tablet condition, one in five (20%) did not succeed in bookmarking a website. A Chi-square test showed that these problems do not differ significantly from laptop and tablet condition. In both the laptop and tablet condition, one 64-year old middle educated woman did not recognize the search engine or input field for text. Because it was the same person that made this mistake on both devices, the difference is not significant. One in five subjects in the laptop condition showed problems related to the mouse. They either double clicked where a single click was sufficient (or the other way around) or used a right click where they were supposed to click with the left mouse button. Obviously, none of the subjects in the tablet condition experienced this since there was no mouse attached. Therefore, there was a significant between the two conditions. Three subjects in the tablet condition showed issues with the keyboard (e.g. not knowing where to click for punctuation marks to pop up) and none of the subjects in the laptop condition experienced this. A Chi-square test showed that these keyboard problems were not significantly different between the two conditions.

4.2.3. Formal skill problems

Table 5. Formal skill problems on laptop and tablet

Formal problems	Laptop		Tablet		
	N	%	N	%	Chi-square
9. Problems with design website	1	1.9	5	9.3	2.824
10. Problems with design menu	1	1.9	0	0	1.009
11. Problems with orientation on website	3	5.6	1	1.9	1.038
12. Entering new window without realizing	0	0	1	1.9	1.009
14. Going with search suggestion	10	18.5	7	13	.628

*p<0.05 ***p<0.001

In the laptop condition, one 62-year old high educated male experienced issues with the different designs of websites and was therefore a little insecure about his actions. In the tablet condition, 9% experienced issues with different designs of websites even though all websites used in the assignments had a responsive nature (e.g. adapts to the screen of the device you are using). It could be that the readability of the website is lower on a smaller tablet screen than on the laptop, since the website design looks similar on both devices. A 69-year old middle educated woman in the laptop condition experienced issues with the layout of the menu and could therefore not complete her task. None of the subjects in the tablet condition

experienced this issue. Three subjects in the laptop condition experienced issues in where they did not fully understand where they were located on a website. Only one 71-year old middle educated man in the tablet condition experienced this.

In the task (either in the laptop or tablet condition depending on what device a subject started), subjects are asked to find a recipe using the search bar on the recipe page. This search bar shows suggestions as soon as you type into it (e.g. you type "Sa" it suggests "Salmon with spinach". Ten (19%) subjects in the laptop condition clicked on the (incorrect) suggestions instead of searching for the correct keywords they typed. In the tablet condition, 13% of the subjects clicked on the suggestion in the search bar instead of searching with their own typed in keywords.

A Chi-square test found no significant difference found between all of the formal skill indices and the amount of subjects that experienced these in the laptop and tablet condition. Therefore we can conclude that these formal problems that were encountered are not medium related.

4.2.4. Information skill problems

Table 6. Information skill problems on laptop and tablet

Information problems	Laptop		Tablet		
	N	%	N	%	Chi-square
15. Not choosing proper search system	1	1.9	1	1.9	.000
16. Using wrong search queries	1	1.9	0	0	1.009
17. Using specific queries to the task	47	87	47	87	.000
18. Not using Booleans in search queries	51	94.4	51	94.4	.000
19. Not using advanced search methods	52	96.3	51	94.4	.210
20. Not searching within results	4	7.4	6	11.1	.441
22. Clicking sponsored ads in Google	1	1.9	0	0	1.009
23. Not checking past first three results	37	68.5	42	77.8	1.179
24. Not checking past first page of results	51	94.4	51	94.4	.000
25. Choosing irrelevant results	1	1.9	2	3.7	.343
27. Using wrong information	1	1.9	0	0	1.009
30. Not checking information	53	97.1	54	100	-1.009

*p<0.05 ***p<0.001

In the laptop condition, one 71-year old middle educated man did not use a proper way of searching. In the tablet condition a 71-year old low educated woman did this. In the laptop condition, a 58-year old high educated woman used a search query that was too broad and not emergent from the task. On a positive note, in both conditions 87% of the subjects used search queries specific to the task in order to find a correct answer to the question in the assignment. When using a search engine, 94% of the subjects in both conditions did not use Booleans to limit search results (e.g. parenthesis). Also, 96% of subjects in the laptop condition and 94% of subjects in the tablet condition did not use advanced search methods (excluding keywords or dates). That does not mean that the rest of the subjects did use advanced search methods, they did not follow the instructions in the assignment correctly and went directly to the website of the supermarket instead of using Google to find its opening hours. Four of the

subjects in the laptop condition did not search within the search results, but got the answer to the question from looking at the metatag description below the title of every search result in Google. In the tablet condition, 11% of the subjects did this.

Because of the nature of the assignment (finding opening hours for a supermarket/maximum speed in a country on the motorway), almost no sponsored content was shown on Google. Only when using the name of the supermarket as the search query, a sponsored link was shown and therefore only one participant in the laptop condition clicked the sponsored link. No one in the tablet condition clicked sponsored ads in Google. Many subjects did not look further than the first three search results, 69% of the subjects in the laptop condition did this and 78% of the subjects in the tablet condition. Almost everyone in both conditions (94%) did not look past the first page of search results. The same applies here as with the usage of advanced search methods, some subjects went directly to the supermarkets website instead of using Google, so they have not been coded in this section. In the laptop condition, only one low educated 71-year old woman chose an irrelevant search result, where two people in the tablet condition did this. While on the laptop, one 64-year old high educated woman used information that was not applicable to the situation. Apart from one subject in the laptop condition, none of the subjects checked their information on another website. In the tablet condition, no one checked to see if they had found the correct answer.

To determine whether there are significant differences in the problems occurring in both conditions, a Chi-square was performed. There results were not significant for all of the information skill problems, which means that the information skill indices are also not medium related.

4.2.5. Communication skill problems

Table 7. Communication skill problems on laptop and tablet

Communication problems	Laptop		Tablet		
	N	%	N	%	Chi-square
31. Failing to log in	2	3.7	2	3.7	.000
32. Only scrolling Twitter feed	0	0	3	5.6	3.086
33. Not directing Tweet at user	13	24.1	7	13	2.209
34. Failing to add an image to a Tweet	7	13	12	22.2	1.597
35. Sending a PM instead of a Tweet	7	13	6	11.1	0.087
37. Failing to send FB comment	8	14.8	8	14.8	.000

*p<0.05 ***p<0.001

Two subjects in both conditions experienced problems with logging into Twitter. They did not see the log in button that is in the bottom right corner. None of them used Twitter themselves in their personal lives. Three subjects in the tablet condition, who also did not use Twitter themselves, only scrolled the Twitter news feed on the tablet for several minutes, before giving up saying they did not know how to send a Tweet. When using Twitter in the laptop condition, 24% of the subjects did not know how to send a Tweet to another person (using @nickname). They either sent the Tweet in general or sent a direct message (13%). Seven (13%) of the subjects in the laptop condition were unable to add a photo to the Tweet. Interesting is that in the tablet condition, only 13% experienced issues with sending a Tweet

directly at another user, but 22% failed to add a photo to the Tweet and 11% sent a personal message instead of a Tweet.

Two subjects in the tablet condition experienced problems with logging into Facebook. They got confused because the application form for a new account is very prominent on the page. Therefore they did not notice the smaller log-in form at the top of the page. Interesting is that one of the two subjects uses Facebook themselves. In both conditions, 15% of the subjects were unable to send the comment they had typed below a post. They were searching for a send button, but Facebook does not have one. Pressing the Enter button is sufficient in order to send your comment. Interesting is that out of the eight subjects that failed, five of them use Facebook themselves. Therefore, you would expect them to know how to send a comment. One 50-year old high educated man in the laptop condition later explained that sending a comment on the Facebook app on his smartphone goes so automatically that he got very confused when asked to do it explicitly on the laptop.

A Chi-square test was performed to determine whether the differences in problems occurring on in both conditions are medium related. The results are not significant and therefore show that the problems encountered are not medium related.

4.2.6. Strategic skill problems

Table 8. Strategic skill problems on laptop and tablet

Strategic problems	Laptop		Tablet		
	N	%	N	%	Chi-square
39. Not knowing how to start	5	9.3	2	3.7	1.375
40. Being misled	1	1.9	0	0	.343
41. Using information from one source	7	13	3	5.6	1.763
42. Working unstructured	4	7.4	8	14.8	1.500
43. Using websites wrong	2	3.7	1	1.9	.343
44. Using a CSE	26	48.1	27	50	.037
45. Making incorrect decision	12	22.2	9	16.7	.532
46. Not making a decision	7	13	7	13	.000
47. Basing decision on incomplete information	9	16.7	4	7.4	2.186
Information problems					
48. Using a broad search query	12	22.2	9	16.7	.532
49. Clicking sponsored ads in Google	32	59.3	26	48.1	1.341

*p<0.05 ***p<0.001

Five (9%) subjects in the laptop condition experienced problems after reading the assignment of the strategic skill task. They did not know where to start the assignment. In the tablet condition, two of the subjects did not know where to start and were also being misled. In the laptop condition, one 52-year old high educated woman was being misled (i.e. because of way the website was designed she searched the wrong way and failed to complete the task correctly). Seven (13%) subjects in the laptop condition only used one source of information to complete the task. Only three subjects in the tablet condition did this. Four subjects in the laptop condition worked in an unstructured way, where in the tablet condition 15% worked unstructured towards an answer. In the tablet condition, one 58-year old middle educated

woman used the website wrong and conclusively made the wrong decision. In the laptop condition, two subjects used websites wrong and therefore made the wrong decisions.

Interesting in this case, is that nearly half (48%) of the subjects in the laptop condition and half (50%) of the subjects in the tablet condition used a Comparison Shopping Engine (CSE) to compare the different options they had to search for in order to prevent having to look up all the options separately. Many of the subjects said these CSE's has their preference since they are easy to use and they feel like they trust the results given by the CSE. In the laptop condition, 22% made a wrong decision based on the information they acquired on the laptop, where in the tablet condition 17% made the wrong decision. Seven (13%) of the subjects in both conditions did not make a decision at all. They were either too confused or got stuck and gave up, even after slight encouragement of the author. In the laptop condition, 17% made a decision based on incomplete information. For instance, they had searched for two out of three options and therefore decided the third option had to be the right one without looking it up first. Only four subjects in the tablet condition did this.

It was noticed that subjects also encountered information type problems during the strategic task. Because of the nature of the information task (almost no possibility of clicking on sponsored content in Google), two of the information task indices were also coded during the strategic task. In the laptop condition, 22% used a search query that was too broad. For instance, when looking for the correct TV (See Appendix A. for the specific task), many people typed: "40 inch Full HD 3D Smart TV" hoping to find the correct model described in the task. They had no knowledge of the fact that there are many TV's that have Full HD, 3D and Smart functionalities and are 40 inches in size. In the tablet condition, one in six (17%) subjects used a broad search query. In the laptop condition, 59% of the subjects clicked the sponsored content in the Google search results where 48% of the subjects in the tablet condition did this.

A Chi-square test showed no significant difference in the amount of subjects that encountered the strategic problems in both conditions. Therefore we can conclude that these problems are not related to the specific use of the medium.

4.3 Demographic related differences

Table 9. Exp(B) values of regression analysis for Internet skills and gender, age and education

Demographic variables	Operational		Formal		Information		Communication		Strategic	
	Laptop	Tablet	Laptop	Tablet	Laptop	Tablet	Laptop	Tablet	Laptop	Tablet
Gender (M/F)	.683	.446	.350	.239	1.898	1.011	.900	.421	.611	1.130
Age	.920	.940	.869*	.807*	.937	.869*	.927	.929	.898	.909
Education (rf Low)										
Medium	2.750	8.000	8.000*	1.159	1.200	.720	.108	1.618	1.583	2.061
High	2.812	4.364	3.733	4.000	.867	1.500	.229	2.250	1.031	2.889

*p<0.05 ***p<0.001

A logistic regression analysis was conducted to test for influences of demographic variables on both conditions. There are some differences between men and woman when it comes to the number of people that completed the tasks successfully. Percentage wise, more men completed the operational, formal and strategic tasks and more women completed the

information and communication task. However, these differences did not turn out to be significant. Therefore we can conclude that gender does not have an influence on the completion of all five Internet skill tasks in both conditions.

In both the laptop and tablet condition, age has a significant influence on the performance on the formal Internet skill task. Younger subjects (<60 years) account for 76% of all the subjects in both conditions that completed the task. Interesting is also that age has a significant influence on the score of the information Internet skill in the tablet condition. Again, younger subjects perform better on the information Internet skill than older subjects. What is interesting is that this effect only shows in the tablet condition. Apparently, there is still much diversity when it comes to experience in searching information on tablets. Some older adults explained that even though they knew how to use a tablet, they feel more comfortable searching for information on their laptop or computer. This diversity is also seen in the years of tablet experience overall. Subjects younger than 60 years account for 64% of all subjects that had one to three years of experience. In the case of three to six years of experience, this goes up to 80%. This diversity is not seen as much in laptop experience, where 91% of the subjects has between ten to thirty years of experience. They have had many years more to improve their information Internet skills.

Among all educational levels, the completion rate is higher on the laptop. The regression analysis shows that, when using the low educated subjects as a reference, there is only a significant difference in the laptop condition on the formal task. This task was performed best by the middle educated subjects with a completion rate of 86% out of all middle educated subjects. This was significantly higher than the low educated subjects with a completion rate of 71%.

5. Discussion

5.1 Main findings

The main purpose of this study was to determine the level of Internet skills of Dutch older adults on both a laptop computer and a tablet. Two research questions were set up:

RQ 1: What is the level of Internet skills of older adults when working on laptops and tablets?

RQ 2: What Internet skill-related problems do older adults experience when working on laptops and tablets?

The general results of the study showed that older adults in the laptop condition show higher operational Internet skills than older adults in the tablet condition. For the other four Internet skills, no difference between devices was found. This means that basic skills, like saving a file, remain to be an issue for older adults. In this case especially on a tablet. On all the other skills, they perform just as good on a laptop as on a tablet. This means that with little training, companies can implement using tablets as a quick way to fill out administration for example. Many domestic care organizations already do this. The portability of a tablet is a much desired feature because care workers can fill out administration while being in the close proximity of a patient. But tablets can not just benefit employees and companies in healthcare, but also in other branches. Sales representatives can use tablets to support their sales pitch and restaurateurs can give waiters a tablet to process orders or even use the tablet as a cash register with the use of an app. The use of tablets also changes the way companies work. For example, luxury retailer Burberry, gives customers a personalized in-store experience by letting their sales associates create a picture of their customers on an iPad based on their previous online sales or demographics (Williams, 2014). Even when an article is not in stock, it can be easily ordered by using the store's iPad.

Except for two problems on the operational task: saving a file and using the mouse incorrectly, none of the other Internet skill-related problems differed significantly between both. In practice, saving a file on a tablet can be easily trained. With just one two second tap on the screen, older adults can learn all kinds of new possibilities. Not just saving a file, but also other options like copying or opening pages in a new tab. Many participants explained that they had never heard of this feature before and if the manufacturer had explained this in for example, the manual, they would have used the feature from the start. Depending on the purpose a company might be using a tablet, this feature can be taught in small training sessions where employees learn to work with the device or app. Outside of the work environment and without tablet manufacturers explicitly and clearly mentioning these features in their manual, older adults will probably need support from either family or friends or websites aimed to help seniors get around the Internet to learn this.

Looking at demographics, age seems to be of significant influence on the formal Internet skills on both devices and on the Internet skill on the tablet. These results stress how important it is for older adults to get enough support and training in using these devices. Even

though van Deursen and van Dijk (2015) have shown that the levels of operational and formal skill levels have increased between 2010 and 2013, older people are still at a disadvantage even though there have been policies that are aimed at improving these skills among specific target groups. But not just these basic skills need attention, Information skills for example hardly improved over this period of time and just for people aged over 65 years (van Deursen and van Dijk, 2015). In an attempt to improve these skills among all older adults, these policies need to be revise. Taken in mind that older adults between 50 and 65 years old often have not retired yet, using computers or tablets becomes more important because they need to participate in a digital working environment.

Even though many older adults use social networking sites, using them to their full extent remains an issue for some older adults. Social networking sites often invest a lot in good working apps, but their mobile website lacks clarity for new users. Functions are unclear and a practical implication of this is that these older adults still cannot stay in contact with other SNS-users. Older adults might start to feel insecure and will need to ask for help. Their confidence in using SNS to stay in touch can drop and they can feel more isolated from the rest of society. SNS should really take this generation into consideration when designing their websites. Perhaps an interface specifically aimed at older adults with simplified functionalities could be an idea. Because it is very important to help this group. They are very interested in using social media to keep up with friends and family and the more skills they learn while keeping in touch with the world, the better chance we have in attempting to narrow down the digital divide.

An issue that came to the surface was the fact that some of the older adults did not know of the possibilities of Google to their full extent. This is just what Joblin (2014) described. Results showed that this group uses broad search queries and trusts in what the first three hits in Google say. An implication of this is that these older adults plow their way through sponsored results and websites with bad lay-outs and unclear information because they have been taught that the first results are often the best. Subsequently, they cannot find the right information and this makes them feel even more insecure of their actions. Trainings about how to search for information on the Internet and how to use Google should be aimed at learning this group what is possible in Google and how to select relevant search results.

Another practical implication of the study was the use of and trust in CSE's (Comparison Shopping Engine). Many older adults in this study used these comparison websites to easily switch between options. It is important to notice how much trust older adults place in these CSE's. A definitive answer given by the CSE was almost always adopted instead of checking it elsewhere. Research by Ong (2011) confirms this feeling of trust, CSE's that are well known (e.g. because they advertise a lot), will have visitors on their website that trust them completely. This poses a threat to the decisiveness of these people. A well thought-out answer was often not given. Prices vary between CSE's (e.g. some energy suppliers can charge up to €28,- a month on their own website compared to their price on the CSE or between CSE's). Serious steps need to be taken to train older adults to remain alert

and not just trust a CSE based on how well known a CSE is (Ong, 2011). That way, older adults can use the CSE's more as a guideline, but not their only source of decision-making.

This study has contributed to the understanding of Internet skills on laptops and also tablets. For example, where van Deursen and van Dijk (2015) found that between 2010 and 2013 the gap between the level of Internet skills of higher and middle/lower educated people widened, this study has shown that there was only a significant difference between education and Internet skills on the formal skill on the laptop. This means, that for this specific age group, older adults aged 50 years and over, education does not play a role. Neither does gender have an influence. This is new insight in the field of digital skills. While older adults are often at a disadvantage because of the influence of age on digital inequality, this study indicates that among this specific group, these demographics have little influence. The gap between older adults of different ages is not seen on most of the Internet skills. This means that, on most facets, older adults aged 70 are not more at a disadvantage than older adults that are 50 years old.

In this study, we can conclude that there were little significant differences between skills on the laptop and on the tablet. This can be taken as a positive note, since it means that older adults do not show worse skills on tablets (except for the operational skill). This had not been studied before in this specific context. Because of these operational skill problems that pose a threat to the developing of the other four Internet skills (without the basics you cannot do the rest), tablets should not be considered as a sole replacement for a laptop without sufficient training. Especially older adults that finally know how to operate one should not be pushed to use other devices if they do not have sufficient time to learn about it. This should be a key factor for companies to keep in mind, otherwise a lot of time and money is wasted because of insufficient skills.

5.2 Limitations and further research

There are several limitations to this study. First of all, because convenience sampling was used to find subjects, the sample size does not permit generalization among the entire population. However, it is still interesting to notice the trend in the data. On the other hand, the way of measuring the Internet skills by performance tests is a valid way (Litt, 2013). But, it is also time-consuming and this can be of influence on the Internet skills. It was noticed that even though some older adults really wanted to succeed and went for a good result, some of them showed signs of tiredness and did not try their best on the last task.

Another limitation of the study is that most of the subjects were partners of each other. Since it was hard to find many subjects, it was easy to ask the spouse of a subject to participate also. For example the man started on the tablet and the woman on the laptop. This was obviously controlled according to how many men and woman had started on one device before. But this caused some competition, even though the subjects were told not to influence each other by speaking out the right answer (they could mumble other things they encountered). Men often felt encouraged when they had finished before their wife and discouraged when their wife had 'beat' them and finished early. This could have been of

influence on the level of Internet skills, since sometimes one had already finished and was waiting with the examiner for over 15 minutes for the other to finish. This could have built up some pressure to finish and therefore influenced the results.

One final limitation is the level of experience older adults in the study reported. A little over a third of the subjects reported to have between three to six years of experience with tablets. With the first iPad being released six years ago, this means that some of the subjects have used tablets since they were broadly adopted. This high level of experience in using tablets might have positively influenced how the subjects completed the tasks. However, the examiner noticed that it was hard for subjects to estimate the years of experience correctly. The experience was often estimated a little high.

Suggestions for future research is using larger sample size. Because of time restrictions, it was not possible to use a larger sample size, but for future research one could make time for this. A larger sample size with all educational levels and gender equally distributed could be generalized to a larger population. Then other factors such as social support, Internet experience and social media use could be investigated further. Also, a study more focused on the communication tasks is suggested. Since this skill type has not been researched before on tablets and laptops, it is interesting to see if there are differences. In this study, social media was used as a way of measuring the communication skill, but for there to be actual communication you need a sender and receiver. Future research could try to initiate this and therefore investigate the communication Internet skill to its full extent. This is especially important for the older generations, since sufficient communication Internet skills can benefit them hugely in social relationships.

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Appendix A.

Table 1

Two sets of assignments either to be completed on a tablet or on a laptop

Set 1

Operational	Go to the website www.google.com. Search in the image section with the word “Birthday” and save one of the photo's you like on the device (where you'll know where to find it)
Formal	Go to the website of Albert Heijn (www.ah.nl) Go to the recipe section and search for “Pasta met zalm”. Take a look at the search results and open the recipe for “Zalmburgers met sugar snaps en citroenpasta”. Return to the search results and open the recipe on the left side of it.
Informational	It's Tuesday afternoon, 08:05PM. You would like to bake a cake, but ran out of milk. Use Google.com to find out whether or not the Lidl at the Wesselernering 2B in Enschede is still open.
Communicative	Go to the website of Twitter (www.twitter.com). Log in with [e-mail] and the password ‘[password].” Write a Tweet to @pietjanssen1980 to congratulate him with his birthday. Also post the photo of the birthday that you saved earlier.
Strategic	You would like to buy a new TV. Your demands are: – 40 inch screen – Smart TV (Internet connection) – 3D – Full HD Three models apply to you: - PHILIPS 40PFK4100 - Panasonic TX-40CS630E - Samsung UE40JU6400 Use a search engine like Google.com to find out which of the three models fit all four of your criteria.

Set 2

Operational	Go to the website of the Telegraaf (www.telegraaf.nl) and save this website as a bookmark.
Formal	Use the search function and search www.telegraaf.nl for the word 'pensioen'. Open the first article you find. In this article, you'll find suggestions for other articles you'd might like at the bottom. Click one of those. Now return to the previous article.
Informational	You are travelling to Sweden by car and you are wondering what the maximum speed is on the motorway. Use a search engine (like Google) to find out.
Communicative	Go to www.facebook.com, log in with [e-mail] and the password '[password]' Go to the Facebook page of the Telegraaf and give your opinion (max. 3 sentences) as a comment on one of the articles that applies to you.
Strategic	You are looking for a new supplier for your electric bill. – You want a fixed price a month. – You do not want to spend more than 145 euro a month. You're doubting between the following suppliers: - Pure Energie (Raedthuys) - Eneco - Greenchoice Use a search engine (like Google) to find out the cheapest option for your situation. You use 3.500kWh of electricity a year and 1.600 cubic meters of gas. Use the postal code [postcode], number [x] and 2 inhabitants if you need to fill in numbers.

Appendix B.

Coding scheme with individual skill problems

Individual Operational Internet Skill problems	
1. Save	Not being able to save a file to the hard disk
2. Favourites	Not being able to add a website to the Favourites (or bookmarks)
3. Form	Using a web form incorrectly (e.g., buttons or pull down menus)
4. Search engine	Not recognizing the search engine or input field
5. Search queries	Using search queries incorrectly (not spelling)
6. Mouse	Using the mouse incorrectly (e.g., double click or right click)
7. Keyboard	Experiencing issues with the keyboard (tablet)
8. Scrollbar	Experiencing scroll bar related problems
Individual Formal Internet Skill problems	
9. Design_Website	Experiencing problems with different website designs
10. Design_Menu	Using website menus incorrectly (e.g., not being able to use scroll over menu's)
11. Orientation_Within	Not knowing where one is located within a website
12. Orientation_Between	Entering a browser window that opens automatically and not realizing this
13. Orientation_Search	Not being able to open more than one search result
14. Orientation_Proposed	Going with the search suggestion instead of own search query
Individual Information Internet Skill problems	
15. System_Proper	Not choosing a proper search system or way of searching
16. Queries_Wrong	Using too broad search queries not emergent from the search task
17. Queries_Specific	*Using search queries specific to the task*
18. Queries _Booleans	Not using Booleans to limit search results (e.g., parenthesis)
19. Search_Advanced	Not using advanced search methods (e.g., date or excluding keywords)
20. Search _Limit	Not searching within search results
21. Search_Luck	Using the Google option "I'm feeling lucky"
22. Select_Sponsor	Choosing sponsored or commercial results
23. Select_First three	Not checking more than the first three search results
24. Select_First page	Not checking more than the first page of search results
25. Select_Irrelevant	Choosing irrelevant search results
26. Information_Form	Filling out a form that does not lead to the necessary information
27. Information_Wrong	Using information that is not applicable to the situation
28. Information_Source	Using information from a less reliable website
29. Information_Date	Using information that is outdated
30. Information_Check	Not checking information on another website
Individual Communicative Internet Skill problems	
31. Login_false	Not knowing how to log in to a social network (Facebook/Twitter)
32. Twitter_scroll	Only scrolling the Twitter feed in order to find the Tweet button
33. Recipient_false	Not knowing how to send a Tweet to someone else
34. Image_false	Not knowing how to add an image to a Tweet
35. PM_false	Sending a personal message instead of a Tweet
36. Locate_FB	Not being able to locate a specific Facebook page
37. Respond_FB	Not knowing how to send a Facebook comment
Individual Strategic Internet Skill problems	
38. Orientation_Stimuli	Being distracted by irrelevant stimuli (e.g., banners/cookie information)

39. Orientation_Start	Not knowing how or where to start with the assignment
40. Action_Misled	Being misled (e.g., working towards a goal that does not deliver personal benefits)
41. Action_Source_Single	Using information from only one website (source)
42. Action_No_structure	Working in a unstructured way (randomly) towards the final answer
43. Action _Support_Wrong	Using websites incorrectly that support the decision-making process
44. Action_Compare	Using a website that compares prices to prevent having to look up all 3 answers separately
45. Decision_Wrong	Making an incorrect decision based on the information acquired
46. Decision_No	Not making a decision at all
47. Decision _Incomplete	Making a decision based on incomplete information
Information problems	
48. Query_Broad	Using a search query that is too broad to find specific information
49. Select_Sponsored	Clicking sponsored ads in Google