Modeling the use of e-government services: The role of internet skills, support sources, gender, age, education, internet experience, employment rate and income.

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Abstract

This study presents a new conceptual model to predict the use of e-government services. It investigates the role of internet skills, type of support, gender, age, education, internet experience, employment rate and income in relation to three types of e-government services: transaction, information and communication services. The study adapts parts of the Unified Theory of Use and Acceptance of Technology (UTAUT) and Technology Acceptance Model (TAM) to the context of e-government services and includes internet skills and types of support. The study were conducted among 540 respondents. The results showed that social influence and effort expectancy is an imported contributor for the use of information services; social influence also contributes to the use of transaction services. In addition, internet experience and education are strong determinants for the use of communication services. Age negatively affects the use of information and transaction services, as well as all internet skills. Men were also determined to use more communication services and have better internet skills. Furthermore, the results revealed that support users have less internet skills, are more frequently women, and most support comes from friends, family or relatives. When using support, no preference for formal or informal (social) support was found between genders; however, people with lower levels of education use more informal help, whereas people with higher education and employment rate use more formal help. No factors of influence were found for support on use of e-government services. This study found that men have higher internet skills, internet experience is positively correlated to internet skills and age negatively correlated to internet skills. People with higher internet skills find it easier to use e-government services. However, the need for e-government services is higher for people with a lower socio-economic status, who also have lower internet skills. Therefore, to increase the use of e-government services, support should be targeted for people with a lower socio-economic status, the elderly and women.

Keywords: UTAUT, TAM, Technology Acceptance, Internet skills, Support sources, E-government, Actual use, Gender, Age, Internet experience.

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1. Introduction

The Dutch government aims to have a fully digital government in 2017, in which businesses and citizens can handle all their affairs with the government digitally. One of the key condition is that the citizens should have sufficient internet skills to independently use digital public services or have the right support services to allow the use of the digital public services.

The difference among the level of internet skills are also referred to as the digital divide. Extensive research has been done about this subject (Carter & Bélanger, 2005; DiMaggio & Hargittai, 2001; Van Deursen, Van Dijk, & Peters, 2011; Van Deursen & Helsper, 2015). Van Dijk, Hanenburg and Pietserson (2006) already investigated the use of e-government services among the Dutch population in 2006 and recognize that the group of stragglers (i.e. mostly people with low education, the elderly and people with low experience in computers and the internet) required special attention and treatment. This is confirmed by a report written in 2013 on behalf of the Ministry of Internal Affairs and Royal Relations of the Netherlands. In 2015, Van Deursen and Helsper found evidence that those with higher social status tend to have more beneficial results from using the internet, which would potentially increase the already existing offline inequalities.

The goal to have a fully digital government in 2017 means that the municipality must adapt public services at the local level. For example, the municipality of Zwolle has a strategic goal to improve their digital services. However, Ebbers, Pieterson, and Noordman (2008) concluded that there is a gap in channel preference (e.g. desk, phone, internet etc.) to use government services between governments and citizens. Zwolle recognized that not everyone can use the 'new' digital services, meaning that traditional services and communication tools, such as customer service via telephone or the front desk, still need to exist. To maximize the number of people who can use the digital services, it is important for the local government to facilitate the learning of digital skills for those citizens who need help entering the digital world.

The local government of Zwolle actively helps its constituents gain more knowledge about the use of internet. For example, Zwolle is working together with *Stadskamer Zwolle* and organize a training called, *Digisterker*, since 2013. In addition, Zwolle wants to collaborate with private and other subsidiary organizations to close the gap of the digitally divided.

There is not clear data on which citizens lack the digital skills to use the online government services. Furthermore, it is not clear which citizens are currently using the online services. This led to the first research question: *"What are the predictors of using e-government services?"*

The researchers Van Deursen, Courtois, and Van Dijk (2014) found that there are three types of support patterns: independents or non-support users, social support seekers and formal help seekers. Formal help is for example, offered by professional and subsidiary organization. Whereas social support comes from neighbors, family, friends or relatives. Even though there is some literature about support sources (Cahoon, 1998; Katz & Aspden, 1997; Selwyn, Gorard, & Furlong, 2006), the research lacks information on the impact of support sources on the use of online services, more specifically on e-government services. To find out the effects of support on the use of online government services, the second research question is as follows: "*To what extent does support impacts the use of e-government services among the receiver?"*

2. Theoretical Background

2.1 Digital divide

The concept of digital divide develops over time. In 2011 Van Deursen and Van Dijk described it as: "The concept of the digital divide rests on a comparative perspective of relative inequality" (p. 125). The vision behind this concept is that people who have access and use information technology like the computer and internet have significantly more benefits in terms of access to money, education, discounts etc. and vice versa.

The term digital divide evolved in the last few decades. The initial meaning was the gap in access to a computer (Van Deursen & Van Dijk, 2011). Likewise, Compaine (2001) said, "the Digital Divide refers to the perceived gap between those who have access to the latest information technologies and those who do not"(p. xi). Later this definition was specified as people who have access to the internet (Van Deursen & Van Dijk, 2011). Since the early 2000s researchers argued the meaning of the digital divide. As increasingly people have access to a computer and internet, the focus of digital divided shifted from a binary classification towards a focus in social, psychological and cultural backgrounds (Van Dijk, 2006). This change of focus resulted in various conceptualizations on how to research the digital divide (DiMaggio & Hargittai, 2001; Mossberger, Tolbert, & Stansbury, 2003; Van Dijk, 2005; Warschauer, 2003).

In most of these conceptualizations, the possession of digital skills are the key factor, which could explain the exponentially increasing amount of information and possibilities on the internet. This switch to the digital era demands a change in society. For example, the shift from traditional communication to digital communication by companies, government and other organizations demands that people acquire new skills to make use of the product, services and benefits that organizations offer through the internet. To benefit from the digitalization, for example online government service, one must develop digital or internet skills.

2.2 Use of online government services

The start of online government service took place at the late nineties. The change from offline to online services was stimulated by an increasing pressure on the budget of public entities. Online services have been seen as the solution to increase performance and efficiency of public agencies. Besides the financial motivation, citizens also demanded more government transparency (Aichholzer, 2001).

In the field of online government or electronic government (e-government) services, typologies are widely used to explain why and how the government interacts with their citizens (Ebbers, Pieterson, & Noordman, 2008). There are many definitions to the term 'service', a few of them are: "Any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product" (Kotler, 2000, pp. 346). "Deed, act, or performance" (Berry, 1980, pp. 236). In addition, "The business transactions that take place between a donor (service provider) and receiver (customer) to produce an outcome that satisfies the customer" (Ramaswamy, 1996, pp. 3).

These examples, although not exhaustive, make it clear that there is no unanimous definition of the concept of service. Some of these definitions are occasionally related to a physical product, while others point out the intangible nature of services. While the definition is hard to pin down, some scholars focus on the classification of interaction types that people call services (Ebbers, Pieterson, & Noordman, 2008). In 2001, Aicholzer classified, a nowadays often used, typology for electronic services, namely: information, communication and transaction services. Bitner, Brown, and Meuter (2002) had a more marketing-oriented approach and classified service into customer service, service

as a product, and free value-added services. Scheepers and Kommers (1994) also make a distinction between services that are used for information provision and products, and concrete goods.

For the research purpose of this paper, Aicholozer's classification is most suitable to use because most of the services that the government has to offer could fit in one of the three described services:

- Information services
- Transaction services
- Communication services

According to Gisler and Sphani (2011), these types of services can be identified in three general content or application areas, namely: administration, political participation and everyday needs. This study focuses on the administration or e-administration part of the online government services (Gisler & Spahni, 2001). See Table 1 for examples:

Table 1. Administration services

Content areas	Information services	Communication services	Transaction services
Administration (e-administration	public service directory, guide to administrative procedures, public registers and databases	email contact with civil servants, politicians, and others	electronic submission of forms, tax fillings, applications for licenses or permits

Examples of informational services are: finding the opening hours of the local government and getting information about requesting a parking permit, among others.

Communication services intend to connect people and the government, specifically via online communication. For example, sending an email to a civil servant or having a chat conversation.

Transaction services are more focused on a transaction, which is usually two-sided communication. Mostly, it involves uploading information, filling out forms and scanning papers. Some examples for e-administration include: a building permit, parking permit, passport request or a certificate of good conduct.

It is clear that governments want to attract constituents to their online channels, due to efficiency, cost cutting and transparency. The question, however, is if this is what people want and if they are capable of using the online channel for government services. This paper aims to understand if people are capable of using online government services and which support sources they use. To adopt a new service channel, many models suggest that people firstly need to have the intention to use a product or services before they actually do it. The next chapter describes the actual use determinants.

2.2.1 Actual use determinants

The government has put immense effort into facilitating the availability of e-government services. To find out if the target group also wants to use these online services, one first needs to know why people behave in a certain way. There are a few well-known theories in the marketing field that predict people's behavior. Most of the used theories are based on the one of Ajzen (1985), who created the theory of planned behavior. This was the foundation of the technology acceptance model (TAM), which shows how users come to accept and use a new technology (Davis, Bagozzi, & Warshaw, 1989). This has been continuously studied and expanded upon, which led to the unified theory of acceptance and use of technology model (UTAUT), which predicts use behavior (Venkatesh, Morris, Davis, G. B., & Davis, F. D., 2003). In 2008, the latest update was given to the TAM (Venkatesh & Bala, 2008), in which

it was adjusted to the upcoming e-commerce and showed 'experiences' as a new relationship. Scholars called this model TAM 3.

The UTAUT and TAM can both help predict and understand the reasons that people behave the way they do (e.g. why people might use or not use e-government services). Both have constructs that lead to intention to use the system, which is a mediator for "actual system use" or "behavioral use." This study measures the actual use directly, because all the e-government services are available to everyone. Therefore behavioral intention (BI) is discarded in this study.

2.3 UTAUT

The UTAUT is based on a consolidated construct from eight prior models that predict the intention to use an information system, including TAM which helps to predict use behavior (Venkatesh, Morris, Davis, G. B., & Davis, F. D., 2003). Although the UTAUT reveals the intention for use, it has been found that this model accounts for an impressive 70% of variance in behavioral intention and around 50% in actual use (Venkatesh et al., 2003). The UTAUT was used in a study conducted by AlAwadhi and Morris (2008) to research e-government services in Kuwait and predict the use of e-government services. The factors of performance expectancy (PE), effort expectancy (EE) and peer influence or social influence (SI) were 60 % accurate, moderated by internet experience, in predicting the use of e-government services for the next four weeks. PE was only significant when moderated by internet experience, which could indicate that people with higher internet experience realize the benefits of e-government services. The factors of PE, EE and peer influence where 60% accurate in predicting the use of e-government services over the next three months and 65% accurate in predicting the use of e-government services in the future. However, they did not find a significant relation between facilitation conditions to predict use (AlAwadhi & Morris, 2008). In a later model, UTAUT 2 extended the UTAUT with two new factors: perceived trust and consumers' innovativeness. Venkatesh et al. (2012) found a 74% accuracy of predicting online purchase intention and 52% online purchase use. The same construct was used by Escobar-Rodríguez & Carvajal-Trujillo (2014) who found that both factors predict 60% of purchase intention and online purchase use. Despite the latter model's focus on online shopping, it still uses the same factors to measure intention and use behavior, which is transferable for e-administration services. As previously mentioned, this study measures actual use directly and expects that the predictors of intention can be used to predict actual use. Therefore the following constructs from the UTAUT are used:

- PE (UTAUT)
- EE (UTAUT)
- SI (UTAUT)

The following hypotheses are made to measure these factors:

H1: PE has a positive effect on the use of e-government services.

H2: EE has a positive effect on the use of e-government services.

H3: SI has a positive effect on the use of e-government services.

2.4 TAM

TAM is one of the eight models used for the UTAUT (Davis, 1989) and it is the most used extension of Ajzen and Fishbein's theory of reasoned action (TRA) (Ajzen & Fishbein, 1980). The TAM measures PEOU and PU (Davis, 1989). Both determine the individual intention to use, which is the mediator for actual use. The predictive power of the TAM model is around 40%, according to Legris, Ingham, and Collerette, (2003). The technology acceptance model suggests that users get to know new technology via two factors that predict the decision making process of how and when someone will use it (Davis, Bagozzi, & Warshaw, 1989). The first factor is perceived usefulness (PU), which is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). The second is perceived ease-of-use (PEOU), which is defined as, "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, pp. 320). This model has been critically analyzed in 2003 by Legris, Ingham, & Collerette (2003), who examined 28 articles that use TAM, theory of reasoned action (TRA) or theory of planned behavior (TPB). Not every article measured every relationship. Most measured the relationships towards attitude and the effect of PEOU on PU. In their paper, the researchers found that 21 out of 26 found a positive relation for PEOU on PU, 16 out of 19 fond a positive relations between PU and behavioral intention, and 10 out of 13 found a significant relation between PEOU and behavioral intention. Finally, 10 out of 11 found a significant positive relationship between behavior intention and actual use. According to these finding, there is usually a significant relation between behavioral intention and use behavior. Some of the scholars suggest that there are similarities of the constructs of the UTAUT model and the TAM by Escobar-Rodríguez & Carvajal-Trujillo (2014). Still, the researcher acknowledges that there is some overlap between the two models; however, the expectation is that using both constructs gives a better prediction of the actual use. Therefore the following factors are used for this study:

- PU (TAM)
- PEOU (TAM)

To discover whether these factors have an influence on the use of online government services, the following hypotheses are made:

H4: PU has an positive effect on the use of e-government services.

H5: PEOU has an positive effect on the use of e-government services.

H6: PEOU has an positive effect on PU.

2.5 Internet skills

As the meaning of digital divide evolved over the years, so did the related studies and concepts. Beginning with access to a computer, the digital divide came to rely on the concept of internet skills, starting with studies that are focused mainly on the technicalities or "button knowledge" of internet use (Bunz, Curry, & Voon, 2007; Hargittai & Hsieh, 2012; Krueger, 2006; Potosky, 2007). Nowadays, internet skills or digital skills have become a broader concept. Abascal, Barbosa, Nicolle, and Zaphiris (2015) stated, "Even if people have access to the technology, some basic knowledge is required to use it"(p. 180). For example, the skill of opening an internet browser can be more difficult or complex, when using it for more advanced applications (Abascal, Barbosa, Nicolle, & Zaphiris, 2015). Van Deursen, Helsper, and Eynon (2014) agreed that internet skills are a more elaborate concept.

Some studies examined specific internet skills, such as navigation, selecting search results, orientations, defining search queries or evaluating information (Van Deursen & Van Dijk, 2011). These studies, did not have a representative sample and are based on self-reporting, which makes them less valid. Other studies elaborated internet skills into various specific skills, however, most interpretations are still restricted and between information searching to technical aspect of use. Furthermore, some scholars stress that measuring these skills also needs to include communication and socio-emotional skills required when using social media (Calvani, Fini, Ranieri, & Picci, 2012; Eshet-Alkalai, 2004; Haythornthwaite, 2007; Helsper & Eynon, 2013; Jenkins, Purushotma, Weigel, Clinton, & Robinson, 2009; Litt, 2013; Van Deursen, Courtois, & Van Dijk, 2014; Van Dijk & Van Deursen, 2014a). Next to these skills, content creation or creative skills are meaningful additions to the concept of internet skills (Ferrari, 2012; Helsper, 2008; Van Deursen, Helsper, & Eynon, 2014; Van Dijk & Van Deursen, 2014b). In 2009, Van Deursen and Van Dijk developed a laboratorial setting for measuring internet skills and split internet skills into medium-related internet skills and content-related internet skills. The medium-related internet skills were divided into two groups, namely operational internet skills, or "the skill to operate digital media" and formal internet skills, or "the skill to handle the special structures of digital media such as menus and hyperlinks." Content-related internet skills consist of information such as, "the skill to search, select and evaluate information in digital media" and strategic internet skills, which include "the skill to employ the information contained in digital media as a means to reach a particular personal or professional goal" (Van Deursen, Helsper, & Eynon, 2014, p.9).

It is clear that measuring internet skills changes over time, due to the fast development and adoption of technology. To measure internet skills, a wide range of skills needs to be included, as it is more than just button knowledge or technical skills, but it also includes social-emotional skills and creative skills.

Van Deursen, Helsper, and Eynon (2014) developed a scale to measure internet skills, considering the skills previously mentioned in this passage. Their goal was to discover the best set of reliable measures of internet skills to use in research, practical and policy impact evaluation settings. After extensive research in the United Kingdom and the Netherlands, they produced the five scales: operational, information navigation, social, creative and mobile based on the two theoretical frameworks from Van Dijk & Van Deursen's (2014) medium- and content-related conceptualization and the media literacy framework, as tested by Helsper & Eynon (2013). All the scales had a long and short version. The short version consists of the top five items per scale (except mobile three items). These skills did not have significant differences between both countries and all have a high reliability. Furthermore, social and creative internet skills have a very strong overlap with the content-related skills. Information navigation and operational internet skills has many of the same items as medium-related skills from the previous research of Van Dijk & Deursen (2014).

The validity and reliability for these items to measure internet skills are good plus the fact that this research was quite recently conducted. There is chosen to use the items of Van Deursen, Helsper, &

Eynon (2014). However, the study concluded that mobile internet skills in the Dutch sample is grouped with operational and navigation items. Since the researchers of the article recommend the use of the shorter scales in larger research project, which applies to this report, the researcher decided to use the shorter scales and not to measure mobile internet skills in this research. As it is clear, internet skills is an important factor in the digital divide, therefore it will be used to find an answer to the first research question. So this study includes the following internet skills as a factor:

Information navigation (medium-related internet skills)

Operational (medium-related internet skills)

Social (content-related internet skills)

Creative (content-related internet skills)

In Van Deursen, Van Dijk, and Peters's study (2011), the relation between medium- and content-related skills was tested, because content-related skills depend somewhat on medium-related internet skills. When someone does not have the skills or knowledge of how to use a computer or an internet browser, it will be more difficult to use the internet in a beneficial way. In this study, the researchers found a positive relation between medium- and content-related skill. Therefore, the following is hypothesis is made:

H7: The level of medium-related internet skill has a positive influence on content-related internet skills.

Mentioned in previous paragraph, it becomes increasingly difficult to use new technology (Abascal, Barbosa, Nicolle, & Zaphiris, 2015). To use 'new' technologies like online services, requires internet skills (Van Deursen, Helsper, and Eynon (2014). A few decades ago Davis (1989) came up with the TAM that predicts the use and acceptance of new technology. One of its factor is perceived ease of use. When one develops internet skills it is estimated that it would be easier to use an online service such as e-government services. To test the relation of internet skills and PEOU, the following hypotheses are made:

H8a: Medium-related internet skills are associated with higher PEOU.

H8b: Content-related internet skills are associated with higher PEOU.

Internet skills next to UTAUT and TAM are expected to be determinants for actual use. As mentioned before, e-administration is part of the online government services that include informational services, communication services and transactional services.

The first service, informational services, are public services directories. For example, information about openings hours, or guides to administrative procedures, such as how to request a permit. To use these services, one requires basic internet technology as well as the skill to navigate and orient oneself. This leads to the following hypothesis:

H9: Medium-related internet skills are associated with greater use of information services.

The second service is communication services. This may include emailing or chatting with a civil servant. This services requires the skill to communicate online with another identity to some extent to have social skills. One must create an email address or chat profile before making use of these services. It is also important to know the appropriate language to use or what information can be shared. Thus, the following hypothesis is made:

H10a: Social skill is associated with more use of communication services.

The last service is transaction services. This consists of electronic submission of forms, tax filling, applications for permits, and usage of the electronic identification like DigiD. To use these kinds of services, one must be able to require the right information, evaluate the information and make the right decision based on the information. One needs to know how to reach the obtained goal. This is associated with content-related internet skills, therefore the following hypothesis is made:

H10b: Content-related internet skills are associated with greater use of transaction services.

Most researcher agree (Abascal, Barbosa, Nicolle, & Zaphiris, 2015; Van Deursen, Helsper, & Eynon, 2014) that to benefit from the digitalization, one must develop digital or internet skills. Therefore, the expectation is that people with more internet skills use more e-government services.

H11a: Medium-related internet skills are associated with higher use of e-government services.

H11b: Content-related internet skills are associated with higher use of e-government services.

2.6 Support sources

Technology access is growing rapidly; a few years ago, people owned only a personal computer or laptop, but nowadays many people have tablets or smartphones to fully benefit from access to the internet. In this digital age, technology becomes more and more important and the digital divide mainly is the differences in skills one need to use the internet (Van Deursen & Van Dijk, 2011). There are many benefits to using the internet: discounts or price comparisons on the internet, earning money via the internet with web shops or vlogs on YouTube, among others. Although the opportunities are almost endless on the internet, it also becomes increasingly complex due to the overload of information on this hypermedia. Not everybody can keep up with the speed of internet. Those who want to keep up and benefit from the internet, but do not have the required skills, could reach out to supportive sources. According to Robinson, DiMaggio and Hargittai (2003) people might consult others to compensate for their lack of internet use. These consultations can also help the support seeker to discover the possibilities of the internet (Van Deursen & Van Dijk, 2011). However, there are different support sources one could consult, for example, social support, such as asking friends, family or neighbors or formal support, such as asking colleagues, calling a computer expert, taking a formal internet course or asking for help in the library (Van Deursen, Courtois, & Van Dijk, 2014). Another option is to independently learn internet skills via self-education, for example reading books about using the internet. Beside using the support source to learn internet skills or help to perform on the internet, one could find someone to facilitate their online needs, e.g. filling in the tax form or shopping online (Reisdorf, 2011). Van Deursen, Courtois, and Van Dijk (2014) revealed three types of support patterns and categorizes them as: social support seekers, formal help seekers and those who do not need help; independents

The independents are self-reliant. They benefit most from the internet and are on average younger, male and possess higher levels of education, with higher employment rates. They perform best on the internet since they have the highest internet skills, compared to social and formal help seekers.

The formal help seekers look more for sources such as colleagues, help desks, computer expert courses, and so on. They benefit less from the internet than the independents, but much more than the social help seekers. They are much older have a higher employment rate, and have lower levels of education, on average. According to van Deursen, Courtois and van Dijk (2014) there is no significant difference between the independents and formal help seekers, concerning operational skills, information skills and strategic skills; however, navigation information skills are stronger for formal help seekers and social support seekers.

The third group, social support seekers, rely on their informal social networks: family, friends or neighbors. This group is characterized by lower education levels, higher rates of women, lower employment rates, and are more likely to be pensioners or stay-at-home parents. This group has the highest medium-related internet skills in comparison with the other two groups, yet they are reported to have the lowest beneficial outcomes (Van Deursen, Courtois, & Van Dijk, 2014).

Van Deursen and Van Dijk (2011) did not find a significant relation between access to social support and higher internet skills. This could be explained by the fact that people cannot teach a skill they do not possess themselves. In the same study, people who rely on formal help have higher internet skills than people rely on social support. This suggests that receiving formal help will increase internet skills more compared to social support. Furthermore, the author expects that people who rely on support also experience more social influence on using e-government services, than people who are self-reliant and do not seek support. The PEOU is expected to be higher for support seekers, because some people need another person to facilitate their internet needs (Reisdorf, 2011), and when they have support, they can more easily use e-government services.

To answer the research question, "To what extent does support impacts the use of e-government services among the receiver?", the study uses a construct adapted from Van Deursen, Courtois, and Van Dijk (2014) to measure type of support.

H12a: Formal support is associated with a higher level of operational, social and creative internet skills.
H12b: Social support is associated with higher information navigation skills.
H13: Receiving support is associated with higher PEOU.

When internet users rely on their informal social networks (Van Deursen, Courtois, & Van Dijk, 2014), they are depending on people who are important in their lives. Besides social influence is defined as, "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh, Morris, Davis, G. B., & Davis, F. D., 2003, p. 445). Rely on informal social network means rely on important others. Hence the expectation is that people requesting help from their social networks are more influenced by that person.

H14: Social support is associated with higher SI.

Finally, people that are looking for help want to use the internet but do not have sufficient skills or they need someone to facilitate this e.g. request unemployment benefits (Reisdorf, 2011). Therefore, help seekers are expected to use more internet services.

H15: Receiving support is associated with a positive effect on use of e-government services.

2.7 Social demographics determinants

It is hard for people to catch up with the digital evolution, which is why digital exclusion is related to traditional forms of social exclusions (Van Deursen & Van Dijk, 2011). The same applies for caregivers, where in the traditional form, a caregiver is relied upon for mental or physical support. Today, people also need digital caregivers. Various studies identified many variables that account for differences in usage, digital skills and support sources.

To understand the differences across demographics, related to support sources, internet skills, and actual use, the questions to answer are: Which factors determine the use of support? Which factors determine internet skill levels? The latter has already been studied by Van Deursen & Van Dijk (2011).

2.7.1 Gender

This study first address gender related to internet skills. Gender in internet usage has been studied extensively, yet there is still no consistent outcome. Goulding and Spacey (2002) revealed that men have more knowledge about the internet and the way they use it. Wasserman and Richmond-Abbott (2005) also found that men tend to use the internet more often, which was related to greater web knowledge. Schumacher and Morahan-Martin (2011) determined, in their study, that men possess greater internet skills than women. This is confirmed by the study of Van Deursen and Van Dijk in 2015, who revealed higher levels of medium- and content-related internet skills for men. However, four years earlier, in another study, Van Deursen and Van Dijk (2011) found no differences of internet skill levels between gender while researching the digital divide.

According to Cooper (2006), woman have more anxiety towards computers and commonly show lower levels of information technology achievements. The internet access gap has recently disappeared in most developed countries and internet use is higher among men, since they were exposed to the technology earlier, due to work-related necessities (Cooper 2006; Cotton & Jelenewicz 2006; Wasserman & Richmond-Abbott, 2005; Zillien & Hargittai, 2009). However, Van Deursen and Van Dijk (2015) showed that men have greater material internet access. In contrast to the other studies, Hargittai and Shafer (2006) argue that gender is not a factor that determines online abilities, rather self-assessed skill is much lower among woman. In terms of support sources, women tend to seek social support, whereas males are mostly independent (Van Deursen, Courtois, & Van Dijk, 2014).

Despite a great number of studies that found a positive relation between being male and computer usage or internet skills, there are some studies that prove the opposite. Due to inconsistency of outcomes, the following hypotheses are made:

H16a: There are no differences between medium-related internet skill and gender.

H16b: There are no differences between content-related internet skill and gender.

Concerning support sources, women tend to look more for (social) support before men do, so the following hypothesis is conceived:

H16c: Gender is associated with different support sources.

2.7.2 Age

The second predictor for internet skills and social support sources is age. Children learn to play on the internet as they grow up, whereas seniors never had the chance to familiarize themselves with the internet. Further, seniors lag in the use of the internet as well as their digital skills (De Haan & Huysmans, 2002). Hargittai (2002) also confirmed this by stating that age is negatively associated with the level of internet skills. According to Zickuhr and Madden (2012), older adults tend to use fewer digital devices.

Van Deursen and Van Dijk (2011) found that the elderly performed more poorly than younger people in medium-related: operational and formal internet skills. Yet, there was not a significant difference in performance for content-related: informational and strategic internet skills (Van Deursen & Van Dijk, 2011). Four years later Van Deursen and Van Dijk (2015) found a negative contribution of age for medium- and content-related skills with a stronger indirect effect on content-related internet skills, indicating that the total effect of age on content-related internet skills can be attributed essentially to lower levels of medium-related internet skills. Both studies suggested that as age increases, medium-related internet skills decrease, but for content-related internet skills, only one of the two studies showed a significant indirect effect of age. The following hypotheses are made.

H17a: Age has a negative effect on medium-related skills.

H17b: Age has no effect on content-related skills.

2.7.3 Education

Education is the most consistent factor used to predict the use of Information and communication technologies (ICT's) worldwide. People with higher educational levels are more likely to own a computer, have broadband internet access and make more use of the internet (Buente & Robbin, 2008). According to De Haan, Huysmans, & Steyaert (2002), cognitive resources are strongly related to the level of education. These resources have a big influence on the differences in internet use and digital skills of different educational groups. Furthermore, Goldin and Katz (2009) claimed that people with higher education can stay updated on technological advancement, which increase their lead over people who cannot, resulting in an increased gap of the digital divide (Van Deursen & Van Dijk, 2011). Rice, MacCreadie and Chang (2001) argue that the positive relation between the level of education someone has attained and internet use is derived from better training, greater awareness and the greater capabilities to evaluate content (Van Deursen & Van Dijk, 2015). People with lower education levels have lower internet skills (Van Deursen & Van Dijk 2011; Hargittai, 2002). When people with low educational levels make use of the internet, they use it in less beneficial ways and more for fun and pleasure (Hargittai & Hinnant 2008; Livingstone & Helsper 2007; Van Deursen & Van Dijk, 2014a; Van Deursen, Van Dijk, & Ten Klooster, 2015).

Concerning the categories of support patterns, the independents contain more people with medium and high levels of education. The lower educated people rely more on the social support like family and friends. Finally, formal help like helpdesks, colleagues, library resources or formal courses are mostly used among low- and medium-educated people (Van Deursen, Courtois, & Van Dijk, 2014).

All these studies suggest that the higher the level of education, the greater the internet skills and beneficial outcomes from internet usage. Therefore, the following hypotheses are made:

H18a: Education level has a positive effect on medium-related internet skills.

H18b: Education level has a positive effect on content-related internet skills.

Since lower educated people rely more on social support, higher educated people are more self-reliant and formal help is mostly used by lower and medium educational levels the following hypothesis is made:

H18c: Education is associated with different support sources.

Finally, because higher educated people are able to keep up with the technological advancement, of which online government services is a component, the following hypothesis is made:

H18d: Education has a positive effect on the use online government services.

2.7.4 Internet experience

Internet experience is mentioned extensively in various studies as the direct competitor for education (Van Deursen & Van Dijk, 2015). In general, the amount of current usage and the length of prior experience is associated with greater technological expertise (Schumacher & Morahan-Martin, 2001). Hargittai (2002) found that internet experience is associated with higher performance in internet skills. In 2011, Van Deursen, Van Dijk and Peters confirmed these findings, specifically for medium-related internet skills. However, internet experience has a greater effect on internet attitude and material access than on internet skills, which suggest that using different and more internet devices does not improve internet skills (Van Deursen & Van Dijk, 2015).

Therefore, the following hypotheses are made:

H19a: internet experience is associated with higher medium-related internet skills.

H19b: internet experience is associated with higher content-related internet skills.

2.7.5 Employment rate

Other factors that could be relevant for predicting internet skills are socioeconomic position. People who have jobs and students are more likely to develop internet skills, because they need those skill to perform, in contrast to unemployed or retired people. However, some studies show that undergraduate students with a relatively high level of education show a decrease in internet skills (Davis, 2003; Volman, Van Eck, Heemskerk & Kuiper, 2005). Van Deursen & Van Dijk (2011) confirm that people with higher socioeconomic status did not have significantly higher internet skills. Due to the opposite outcomes of research the following hypotheses are created:

H20a: Employment rate is associated with higher medium-related internet skills.

H20b: Employment rate is associated with higher content-related internet skills.

Regarding support sources, Van Deursen, Courtois, & Van Dijk (2014) found that pensioners and stay-at-home parents are more likely to look for social support. Alternatively, higher employment rates resulted in more formal help seekers. Higher employment rates also have a positive relation with self-reliance and independents.

H20c: Employment rates are associated with formal support sources.

2.7.6 Income

Income is positively associated to internet adoption, as it is related to a greater capacity to afford the cost of internet access (Van Dijk, 2005; Livingstone & Helsper, 2007; Ono & Zavondny, 2007). Lower income groups tend to have negative attitudes towards the internet (Jackson, Ervin, Gardner, & Schmitt, 2001; Barzilai-Nahon, 2006). DiMaggio, Hargittai, Celeste and Shafer (2004) found that people with higher incomes use the internet more effective and more productively. This group also gains greater economic advantages. Conversely, people with lower incomes tend to use the internet more generally and simplistically (Van Deursen & Van Dijk, 2014a; Van Deursen, Van Dijk, & Ten Klooster, 2015; Van Dijk, 2005). Since people with higher incomes gain more advantages, this expectation is also held for online government services. Therefore, the following hypotheses are made:

H21a: Income is associated with higher medium-related internet skills.

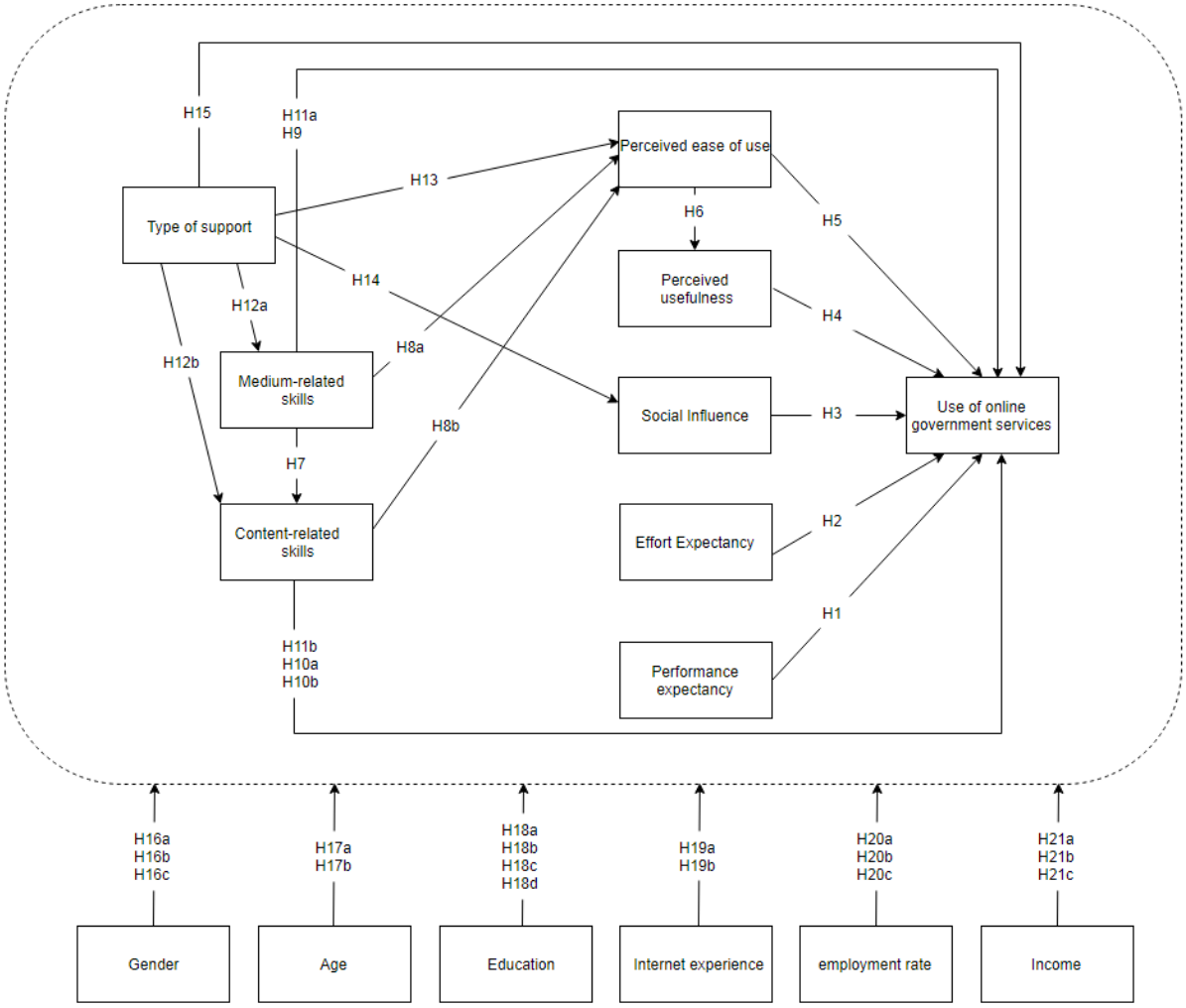
H21b: Income is associated with higher content-related internet skills.

H21c: Income is associated with higher use of online government services.

2.8 Conceptual model

It is clear there are many variables to predict the use of e-government services. The number of variables and the cohesion between these ensures great complexity. This creates the need for a framework to map the complete research. Therefore, a model is developed that serves as a framework for this research. According to the theoretical considerations, the following conceptual model in Figure 1 is suggested. The arrows in this model represent the proposed hypotheses cause-effect relations.

Fig. 1 Conceptual model and proposed hypotheses



Note: Medium-related skills contains operational and information navigation internet skills and content-related internet skills contains social and creative internet skills.

3. Method

The purpose of this paper is to find the predictors for the use of e- government services. In this context, the direct independent variables are age, education, gender, internet experience, social economics, income and use of DigiD. The indirect variables are types of support, internet skills, SI, PE, EE, PEOU, and PU. An extensive literature review was conducted in the field of technological acceptance and e-government services, with a focus on the most relevant items in terms of validity and reliability.

To ensure the quality of the constructs for this research, the items in this questionnaire must score at least 0.7 on the Cronbach's alfa or higher in prior studies. All the constructs were put in a Word document and multiple meetings were held between the staff of the Zwolle municipality from the Department of Research and Information and with The University of Twente to discuss the best possible structure. The questionnaire was finalized with good constructs in terms of reliability and validity and put into the best order according to all stakeholders. The questionnaire was approved by Municipality of Zwolle and the University of Twente.

3.1 samples and procedure

The questionnaire was administered into Enalyser, a survey-program that the municipality of Zwolle uses, once the questionnaire was tested and ready to distribute. For this study, 3000 invitations were sent through traditional mail. Respondents were persuaded through a short invitation text indicating the relevance of the study. See Appendix C. Information about the expected time spent on the survey (15 minutes), benefits for the respondent (a chance to win €25,- VVV-voucher), an explanation about the anonymity of the study, plus an acknowledgement that the respondent could stop at any time when they want, were mentions to gain a higher response rate and a higher degree of freedom. For an example of the introduction letter, see Appendix D. When the respondents decided to participate in the study they had the choice to complete the questionnaire online, by visiting a specific webpage and inputting their randomized questionnaire code, which prevents duplicate responses. They could also send the paper questionnaire free of charge back to the municipality of Zwolle. All the people received an accompanying letter with an elaborate introduction. After the initial invitations, a reminder were sent after two weeks. This reminder was sent to get a higher response rate.

This report contains 540 respondents, obtained via an a-selective sample. All unfinished questionnaires were excluded from the sample. The surveys were administered to inhabitants of the Dutch municipality of Zwolle. The quantitative research method used for this study is based on offline and online questionnaires. Participants were recruited via random sampling of 3000 households sent by mail with a goal of obtaining a sample of 450 respondents. For this study, the minimum age was 16, as younger residents of the municipality would not use many online government services, due to lack of applicability. Respondents were allowed to stop and return to the survey at a later time if they wanted. The time span between the start of distribution of the questionnaires and closing date was 6.5 weeks.

The data of the study was analyzed; 227 males and 312 females and one missing; age range 16-94, M=52,61, SD = 18,1 years. The mean exceeded the average age in the Netherlands, but this is understood since people under 16 were not included in this study. Most respondent were born in the Netherlands (90.1%). In total, 3000 invitations were send, which indicates a response rate of 18%. It can be concluded that the study was well received, as normally the response rate is 10-12% for the municipality of Zwolle.

Table 2 summarizes the demographic characteristics of the study.

Table 2 Demographic profile

	N	%
Gender		
Male	227	42.1
Female	312	57.9
Age		
16-40	147	27.3
40-60	190	35.2
> 60	202	37.5

3.2 Measures

To process all the data, the statistical program, SPSS version 24 was used, which is well-known and used in the academic field, as well as at the municipality of Zwolle. Next to SPSS, IBM AMOS version 20 is used, which is used for the Structural Equation Model (SEM). The digital questionnaire could be imported to SPSS the others were manually entered into the SPSS program.

In this study, respondents were tested on internet skills, support sources, and the usage behavior, specifically to test the respondents' use of e-government services in the municipality of Zwolle. Existing scales were used, except for the actual use of e-government services, for which a new scale was developed. The existing scales were used in many prior studies, as discussed in the literature review, to test if respondents want to use e-government services, SI, EE and PE. A five-point Likert scale was used, ranging from strongly disagree to strongly agree, adopted from the scales of Vankatesh et al. (2003), which was extensively researched and therefore, more sources were used (AlAwadhi & Morris, 2008; Venkatesh & Bala, 2008; Venkatesh & Zhang, 2010). Beside the items of Vankatesh et al. (2003), PEOU and PU was tested to indicated the use e-government services. To test these constructs, the 5 point scale of Davis (1989) was used. The survey was also administered to test respondents' internet skills. To test these, the existing five-point Likert scale ranging from "Completely do not fit to me" to "Completely fit to me" from Van Deursen, Helsperand, and Eynon (2014) was used. To measure the constructs for support sources, Van Deursen & Van Dijk's items (2011) were adopted. To increase validity, several steps in the development of instruments like item selection, item requirements, instrument testing, adaptation of the item and questionnaire constructing are discussed in the following sections.

To measure the use of online government services eleven of the items from UTAUT cover SI (four items), effort expectancy (three items), and PE (four items). The scale uses five-point Likert responses, ranging from completely disagree to completely agree. An example of a PE item is, "I find it useful to use online services of the municipality of Zwolle."

The other scale that was adapted from Davis (1989) covers PEOU (three items) and PU (three items), both on a five-point Likert scale ranging from completely disagree to completely agree. An example of an item for PEOU is, "I think it is easy to use online government services of the municipality of Zwolle."

To find out if internet skills are a predictor for use of e-government services, internet skills are measured by adopting the short 20-item scale proposed by Van Deursen, Helsper, and Eynon (2014). All internet skill items are equally distributed over medium-related internet skills, which are information-navigation and operational skills, and content-related internet skills, which include social and creative skills. Short scales were used to keep the total number of items acceptable for the respondents. The scale uses a five-point Likert scale with the range of 'completely does not fit to me' to 'fits completely to me' and a sixth option, "I do not know what this means."

An eight item scale developed by Van Deursen Courtois and Van Dijk (2014) was used to asses if the respondents use support sources that people might address when they experience a lack of internet skill. These scales were dichotomous and the respondent could check the box if they used the type of support or not. This scale allowed people to fall into the three categories of help seekers, as defined by Van Deursen Courtois and Van Dijk (2014): independents, socially supported and formal help seekers.

To measure the actual use of e-government services, the researcher developed, in collaboration with the Research and Information Department of the municipality of Zwolle, a 12-item scale to measure actual use of e-government services. The scale contains four items to measure transactional services, four items for information services and the last four items to measure communication services. According to the municipality of Zwolle, the four items for each service represent the most commonly used online services for the transaction, communication and information services.

Finally, the questionnaire was pre-tested by ten participants living in the municipality of Zwolle to examine the clarity of the questions. The participants were asked to give feedback on how well they understood the questions, and if they did not understand, they were ask to mark the question for further discussion. After the discussion, a small adjustment was made to the introduction of the questions about actual use. An overview of all final measures including the mean, standard deviations and internal reliability of the measures can be found in the Appendix A: Means, standard deviations, and reliability.

Some of the items were adapted to the context of the use of online government services. The scales of Venkatesh et al. (2003) are originally applied to an information system or technology. In this study, it is applied to e-government services. Furthermore, the context was not always the same because this study targeted residents and not employees, so a question like “I would find <the system> useful in my job” was replaced with “I would find online government services useful”. An overview of the old and new constructs can be found in Appendix B. The questionnaire was only distributed to Dutch inhabitants, since Dutch is the most common language in the Netherlands. All non-Dutch items were translated from English to Dutch.

The mean scores and standard deviations of most important items of the measures are now discussed. The mean scores for all internet skills variables in this study showed that on average, the score for creative skill (M = 2.69, SD = 0.96) was lower compared to the other internet skills: information navigation skill (M=3.86, SD = 0,80), operational skill (M=3.83, SD = 1.02) and social skill (M=3.83, SD= 0.99). This indicated that people have less creative internet skills and so creative skill is harder to possess for an individual. See Table 3 for an overview.

Regarding the use of support sources, 32.3% of the participants indicated that they need help with the use of internet. The large majority, 90.8%, ask friends, family or relatives when they need help. The second most used source is asking a computer expert or helpdesk, used by 17.9% of the participants. Notably, 1.7% of the respondents did not know who to ask when they needed help with internet. Despite the low number, it is a concern that nowadays, people still do not know where to find help for something related to internet. An overview of the mean score, standard deviation and percentage of all items can be found in Appendix A.

The mean score for all e-government services on a scale of 0-4 number of used services showed that on average, transactional services scored much lower (M=0.42, SD=0.79) than information services (M=1.26, SD=1.20) and communication services (M=1.23, SD=1.03). The lower score on transactional services could be explained by the fact that these services cost more effort and time than communication or informational services, or that people need these services less frequently. On the

other hand Ebbers, Jansen, and van Deursen (2016) found that different types of services (e.g. registration or consolidation) correlates with different channel preferences (e.g. online or offline).

The mean of the UTAUT and TAM constructs to predict the use of e-government services are showed in Table 4: UTAUT and TAM model outcomes. In this study, EE (M=3.47, SD=0.83) and PEOU (M=3.40, SD=0.83) scored on average higher than PU, PE(M=3.20, SD=0.61) and SI (M=2.55, SD=0.73). Importantly, SI scores much lower than the rest, suggesting that people that are important to the respondent have limited influence on whether the respondent uses online government services or not.

Types of support sources are split as described before into social support and formal support. Social support are family, friends, neighbors and relatives. 95.4% of the people say that they use social support. The actual use is: transactional services 0.42, information services 1.26 and communication services 1.23, which in total is 2.91 services on average, per person.

Looking at employment rate (Table 5), 51.7% were employed (e.g. employee, employer, company owner, self-employed), 5.7% were students and 42.6% were unemployed (e.g. not employed, retired, disabled to work, partner that is wage-earner).

Table 3 Mean and standard deviation of internet skills

	M	SD
Information navigation skill *(five-point scale)*	3.86	0.80
Operational skill *(five-point scale)*	3.83	1.02
Social skill *(five-point scale)*	3.83	0.99
Creative skill *(five-point scale)*	2.69	0.96

Table 4 UTAUT and TAM model outcomes

	M	SD
Perceived Ease of Use (five-point scale)	3.40	0.83
Perceived Usefulness (five-point scale)	3.05	0.75
Social influence (five-point scale)	2.55	0.73
Effort Expectancy (five-point scale)	3.47	0.83
Performance Expectancy (five-point scale)	3.20	0.61

Table 5 Number and percentage of employment rate

	N	%
Unemployed	230	42.6
Student	31	5.7
Employed	279	51.7

* 1 missing value

3.3 Data analysis

To analyze and measure the UTAUT model, structural equation modeling (SEM) was used in a previous study (Williams, Rana, & Dwivedi, 2015). The use of SEM is mostly accepted in social sciences due to the ability to ascribe relationships between unobserved constructs (latent variables) from observable variables (MacCallum & Austin, 2000). To test the hypotheses and the relations of the presented conceptual model, different methods were used. Most of the study is analyzed by using SEM, AMOS 20, but also multi-regression analyses and chi-square analyses, IBM SPSS version 24 was used, because not all the data fit into the SEM.

To use the SEM for this study model, the validated scales consist of a large number of items. The data submitted to the SEM were composite scales rather than the individual items. Parceling the items is quite common (Bandalos & Finney, 2001). The SEM model is hard to use when there are missing values, therefore the missing values where replaced by the mean of the item, so that every relation could be measured. Hair (2006) suggests a couple of indices to obtain a comprehensive model fit: the $\chi 2$ statistic and the ratio of to $\chi 2$ its degree of freedom ($\chi 2/df$) with its P-value. Furthermore the Tucker-Lewis index (TLI), the standardized root mean residual (SRMR) and finally the root mean square error of approximation (RMSEA), with its associated confidence interval (Hooper, Coughlan, & Mullen, 2008; Van Deursen, Bolle, Hegner, & Kommers, 2015). Besides the Hair indices, other scholars suggest the CFI (comparative fit index), which was first introduced by Bentler (1990).

Hooper, Coughlan, and Mullen (2008) also suggest including one parsimony fit index, such as the Normed-fit index (NFI), developed by Mulaik et al. (1989). Bentler and Bonnet (1980) indicate that a 0.80 value indicates a good fit; however, a more recent study of (Hu & Bentler, 1999) sets the cut-off criteria at ≥ 0.95. One of the major drawbacks is the sensitivity of sample-size, underestimated fit for samples less than 200 (Mulaik et al., 1989; Bentler, 1990). This drawback could be rectified by the non-normed fit index or, as called above, the Tucker-Lewis index.

The plethora of indices, makes it tempting to use the ones that indicate the best fit. According to Hooper, Coughlan and Mullen (2008), this should always be avoided. After extensive research they suggested to include the Chi-square statistic, Chi-square/df and its P-value, as well as the RMSEA and its associated confidence interval, the SRMR, the comparative fit index (CFI: Bentler, 1990) and one parsimony fit index such as the NFI (Mulaik et al., 1989).

To test all hypotheses, including the ones that do not fit the SEM, the analyses for this study first focused on the general descriptive statics, followed by comparing the means, conducting a correlation analysis, executing the SEM and finally a multiple regression and chi-square analyses.

4. Results

4.1 Correlation matrix

The results begin with the correlation analysis, which is shown in Appendix E. The most important findings, in words of minimum significance of 0.05 and at least a correlation of ≤ 0.30 of study one, can be found in Table 6. Cohen (1988) suggest that a correlation between 0.1-0.3 is weak, 0.3-0.5 medium and between 0.5-0.7 is strongly correlated. Other scholars like Evans (1996) proposed interpreting the relationship as follows: 0.00-0.19 is "very weak", 0.20-0.39 is "weak", 0.40-0.59 is "moderate", 0.60-0.79 is "strong", and 0.80-1.00 is "very strong". To interpret the correlation matrix with at least a weak correlation, the researcher chose to show only the correlation with ≤ 0.30 in the table below. Notably, gender did not correlate with any variable.

Actual use of services

The variables of the UTAUT and TAM model, PE, effort, expectancy and PU all correlate (r= 0.36-0.48) with actual use of e-government services, however SI (0.22) was not sufficient. Not all internet skills correlate with actual use, while operational, social and creative skills are correlating (r= 0.33-0.41), information navigation was not noteworthy (0.19). Age is also an indicator of using e-government services, since there is a negative correlation (-0.42). Furthermore internet experience (0.40), employment rate (0.32) and the use of DigiD (0.38) correlates with actual use.

Internet skills

Information navigation skills correlate with: EE (0.42) and PEOU (0.37) and also with age (-0.33), education (0.32), internet experience (0.31) and employment rate (0.37).

Operational skill correlates with EE (0.69), PE (0.40), PEOU (0.62), PU (0.42), age(-0.52), education (0.39), internet experience (0.62), employment rate (0.48), income (0.33) and the use of DigiD (0.45).

Social skills correlates with EE (0.65), PE (0.38), PEOU (0.59), PU (0.37), age(-0.53), education (0.39), internet experience (0.62), employment rate (0.46), income (0.31) and the use of DigiD (0.44).

Creative skill correlates with EE (0.50), PEOU (0.41), PU (0.36), age(-0.35), education (0.32), internet experience (0.37), employment rate (0.34), income (0.33) and the use of DigiD (0.45).

Support

There is a negative relation between use of support and PEOU, which is in contrast to the hypothesis. Also EE correlates negatively. This indicates that people receiving support find it harder to use of e-government services and they think these services requires more effort. People receiving support also have moderate correlation with all four internet skills, suggesting that people receiving support indeed have lower internet skills than those who do not. Age has a positive correlation on receiving support, which means people who are receiving support are generally older.

Table 6 Correlation overview study one

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1.Support	-																					
2.Transaction services		-																				
3.Information services		.382**	-																			
4.Communication service		.408**	.498**	-																		
5.All services		.696**	.840**	.814**	-																	
6. EE	-.446**		.407**	.441**	.482**	-																
7. PE			.313**	.309**	.355**	.691**	-															
8. PEOU	-.404**		.388**	.426**	.472**	.899**	.765**	-														
9.PU			.305**	.318**	.367**	.680**	.726**	.718**	-													
10.BI			.335**	.333**	.390**	.609**	.670**	.664**	.651**	-												
11.SI							.484**	.311**	.514**	.518**	-											
12.Information navigation	-.434**					.420**		.374**				-										
13.Operational	-.546**		.352**	.346**	.411**	.687**	.397**	.619**	.419**	.428**		.448**	-									
14.Social	-.469**		.326**	.344**	.393**	.653**	.376**	.593**	.374**	.409**		.390**	.855**	-								
15.Creative	-.436**			.305**	.333**	.498**		.414**	.364**	.362**			.690**	.618**	-							
16.Age	.393**	-.307**	-.376**		-.416**	-.475**		-.466**	-.339**			-.332**	-.524**	-.532**	-.353**	-						
17.Gender																	-					
18.Education						.366**		.309**				.319**	.398**	.389**	.315**			-				
19.internet experience			.333**	.386**	.404**	.621**	.458**	.576**	.432**	.414**	.141**	.314**	.620**	.622**	.374**	-.480**		.355**	-			
20.Employment rate	-.335**				.324**	.388**		.358**				.336**	.475**	.458**	.341**	-.567**		.335**	.381**	-		
21.Income													.326**	.310**				.521**	.347**	.351**	-	
22.DigiD			.293**	.380**	.380**	.467**	.365**	.455**	.305**	.353**	.149**		.451**	.436**		-.298**		.327**	.543**			-

**Correlation at least ≤ 0.30 and significant at the 0.01 level (2-tailed)

*Correlation at least ≤ 0.30 and is significant at the 0.05 level (2-tailed)

4.2 Analysis

To test the hypotheses, as mentioned before, several analyses are used. The concept model in this study is initially made to test the hypotheses via the SEM model, however, not all variables can be measured by the SEM. To test the hypotheses that did not fit the model, other tests like regression analyses and Chi-Squares were used. First, this chapter describes the SEM, followed by the regression- and Chi-Square analyses.

4.2.1 Structural and path model

To test the hypotheses and initially to find an answer to the research question, SEM is applied for every type of e-government services (e.g. transactional, informational and communication services). This leads to the testing of the use of e-government services three times. The relations between the tested variables and the type of government services are tested separately. To make the SEM model fitted, some of the relations in the concept model were adjusted or added.

The basic assumption for these indices to test the SEM are: the Chi-square with a P-value of < 0.05, the Chi-square/degree of freedom lower than 2.0 (Hooper, Coughlan, & Mullen, 2008). The RMSEA values of 0.07 are acceptable (Steiger, 2007) and under 0.03 represents excellent fit. The SRMR is acceptable when it is lower than 0.08 (Hu & Bentler, 1999). The TLI, also known as the non-normed fit index (Hooper, Coughlan, & Mullen, 2008) has a recommendation as low as 0.80, but Bentler and Hu (1999) suggested ≥0.95. The goodness of fit for the NFI is <0.90 (Mulaik et al., 1989).

Due to the adjustments, the SEM fitted and all basic assumptions were met. Hoelter's critical N is examined to judge if the sample size is adequate for applying SEM for all models, resulting in a N546 - N574 at .05 significance, this is sufficient since the sample size is adequate if Hoelter's N>200 per group. Table 7 displays the fit results obtained from testing the validity of a casual structure of the conceptual model, were the use of e-government services was tested three times with the specific service. These indices are as follows for transitional services: $\chi2(40) = 56.872$; $\chi2/DF=1.422$; SRMR=.03; TLI=.99; RMSEA=0.03 (90% confidence interval CI = .01, .04). The model indicates 12% of the actual use for transactional services. Indices for communication services are: $\chi2(37) = 50.596$; $\chi2/DF=1.367$; SRMR=.03; TLI=.99; RMSEA=0.03 (90% confidence interval CI = .01, .04). The model shows 24% of the actual use of communication services. The results of informational services are: $\chi2(40) = 56.081$; $\chi2/DF=1.402$; SRMR=.03; TLI=.99; RMSEA=0.03 (90% confidence interval CI = .01, .04). The actual use of informational services is 21%, as explained by this model.

The correlation between variables is already discussed in previous paragraph in addition fig 2 , 3 and 4 provides the path models with coefficients and variance explained per model

Table 7 Fit indices for structural equation modelling

Service	Chi-square				Baseline comparison			RMSEA			SRMR	Hoelter
	χ2	DF	P	χ2/DF	NFI	TLI	CFI	RMSEA	LO90	HI90	SRMR	N at .05
Transactional	56.872	40	.04	1.422	.99	.99	.99	.03	.01	.04	.03	546
Communicational	50.596	37	*.07*	1.367	.99	.99	.99	.03	.01	.04	.03	574
Informational	56.081	40	.05	1.402	.99	.99	.99	.03	.01	.04	.03	553

Note: numbers are significant at <0.05, expect the one in italics

Fig. 2 Communication services *Results for the research model with path coefficients. Note: *p < .05; **p < .01; *** p < .001 level. Squared multiple correlations are underlined.*

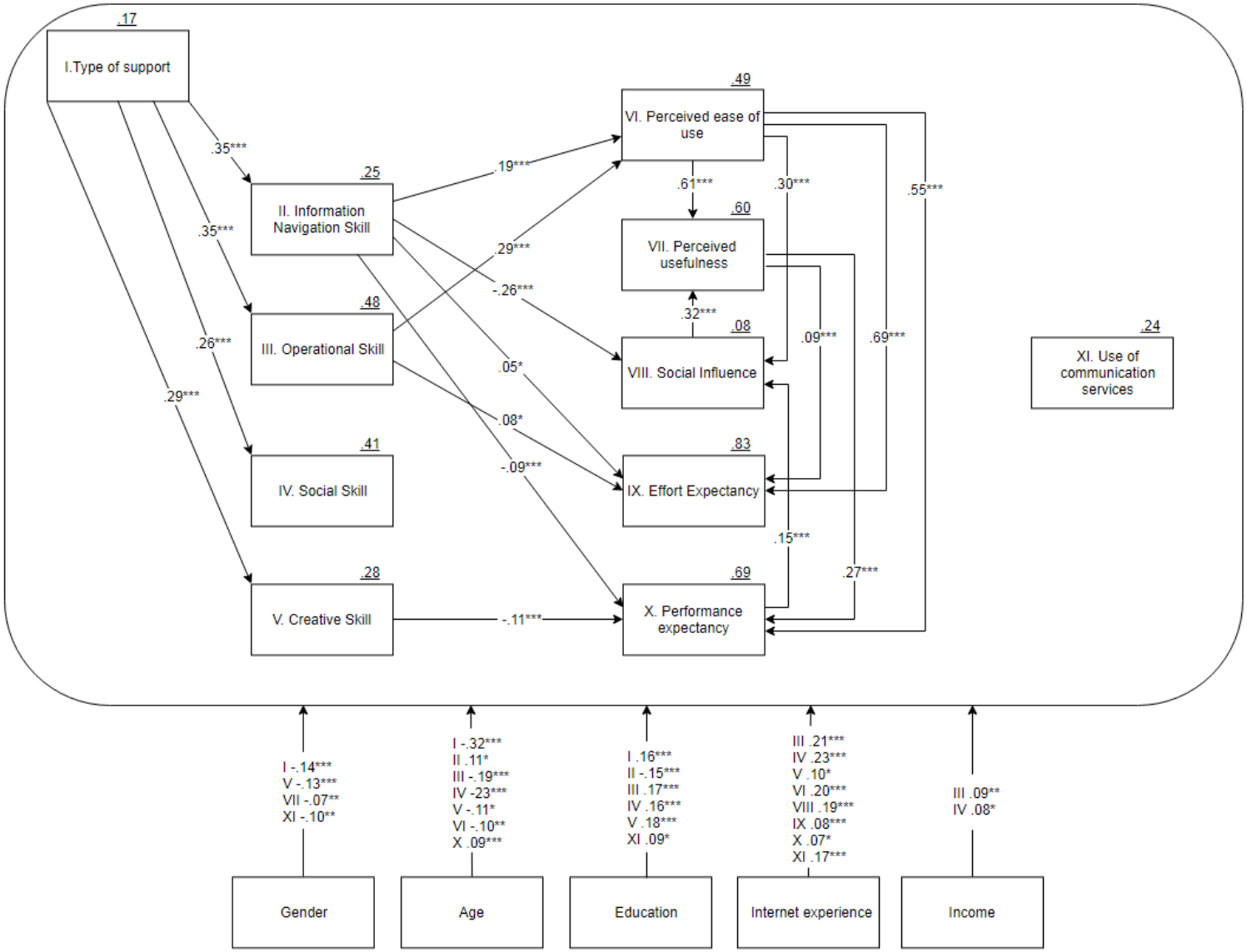


Fig. 3 Transaction services *Results for the research model with path coefficients. Note: *p < .05; **p < .01; *** p < .001 level. Squared multiple correlations are underlined.*

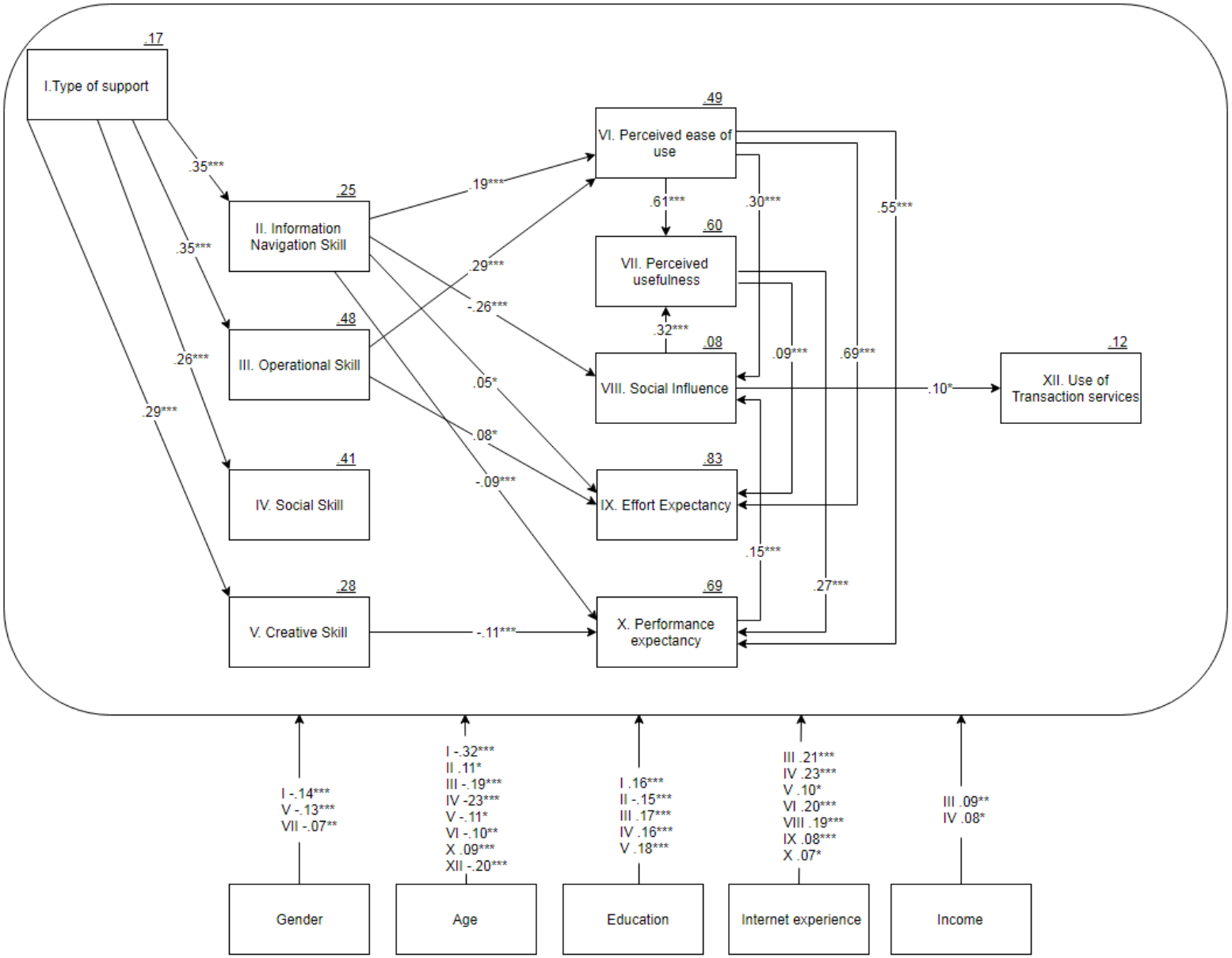
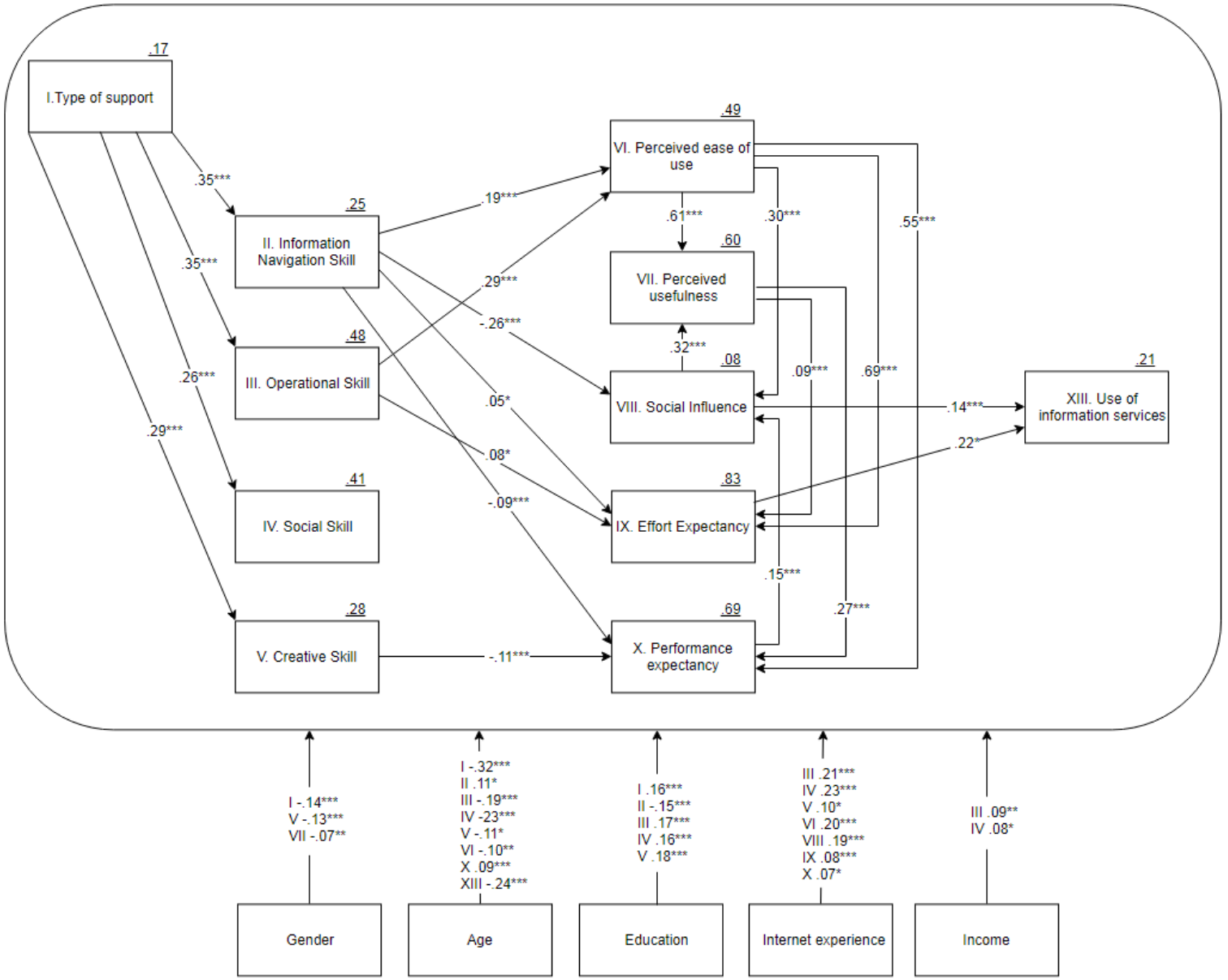


Fig. 4 Information services *Results for the research model with path coefficients. Note: *p < .05; **p < .01; *** p < .001 level. Squared multiple correlations are underlined.*



Not all hypotheses could be tested in the SEM. Type of support could only partly be measured as “make use of support” or “not make use of support”. However not specific on support it self (e.g. formal or informal support). Socioeconomic status was coded into unemployed, students and employed, which made them not a good fit to test in the SEM. Similarly, DigiD was excluded from the SEM. As mentioned earlier, behavioral intention is not included because the items were related to the use of e-government services in the future, but respondents also give answers if they actually use e-government services. To test the validation of the remaining hypotheses, the direct, indirect and total effect of each measurable hypothesis is shown in Table 8.

Table 8 Significant direct, indirect and total effects for structural equation model

Link	Direct effects β	Indirect effects β	Total effects β	Validation
H1. PE - e-government services*				**Partly supported**
PE - transactional services	x	.02	.02	Partly supported
PE - informational services	x	.04	.04	Partly supported
PE - communication services	x	x	x	Rejected
H2. EE - e-government services*				**Partly supported**
EE - transactional services	x	x	x	Rejected
EE - informational services	.22	.17	.39	Accepted
EE - communication services	x	x	x	Rejected
H3. SI - e-government services*				**Partly supported**
SI - transactional services	.10	.05	.15	Accepted
SI - informational services	.14	.08	.22	Accepted
SI - communication services	x	x	x	Rejected
H4. PU - e-government services*				**Partly supported**
PU - transactional services	x	.00	.00	Rejected
PU - informational services	x	.04	.04	Partly supported
PU - communication services	x	x	x	Rejected
H5. PEOU - e-government services*				**Partly supported**
PEOU - transactional services	x	.04	.04	Partly supported
PEOU - informational services	x	.22	.22	Partly supported
PEOU - communication services	x	x	x	Rejected

H6. PEOU - PU	.61	.12	.73	**Accepted**
H8a. Medium-related internet skills - PEOU				**Accepted**
Information navigation skills - PEOU	.19	-.02	.17	Accepted
Operational internet skills - PEOU	.29	.27	.47	Accepted
H8b. Content-related internet skills - PEOU				**Rejected**
Social skill - PEOU	x	x	x	Rejected
Creative skill - PEOU	x	x	x	Rejected
H9 Medium-related internet skills - Informational services	H9a	H9a	H9a	**Partly supported**
H10a. Content-related internet skills - transaction services				**Rejected**
Social skill - use of transaction services	x	x	x	Rejected
Creative skill - use of transaction services	x	-.00	-.00	Rejected
H10b. Social internet skill - use of communication services	H9b	H9b	H9b	**Rejected**
H11a. Medium-related internet skills - e-government services				**Partly supported**
Information navigation skill - transactional services	x	-.03	-.03	Rejected
Information navigation skill - informational services	x	-.04	-.04	Rejected
Information navigation skill - communication services	x	x	x	Rejected
Operational internet skill - transactional services	x	.01	.01	Rejected
Operational internet skill - informational services	x	.03	.03	Partly supported
Operational internet skill - communication services	x	x	x	Rejected
H11b. Content-related internet skills - e-government services				**Rejected**
social skill - transactional services	x	x	x	Rejected
Social skill - informational services	x	x	x	Rejected
Social skill - communication services	x	x	x	Rejected
Creative skill - transactional services	.00	.00	.00	Rejected
Creative skill - informational services	.00	.00	.00	Rejected
Creative skill - communication services	x	x	x	Rejected
H13. Support - PEOU	x	.17	.17	**Rejected**
H15. Support - e-government services*				**Rejected**
Support - transactional services*	x	.01	.01	Rejected
Support - informational services*	x	.03	.03	Rejected

Support - communication services*	x	x	x	Rejected
H16a. Gender - medium-related internet skills				**Rejected**
Gender - information navigation skill	x	-.05	-.05	Rejected
Gender - operational skill	x	-.05	-.05	Rejected
H16b. Gender - content-related internet skills				**Rejected**
Gender - social skill	x	-.06	-.06	Rejected
Gender - creative skill	-.13	-.06	-.19	Rejected
H17a. Age - medium-related internet skills (older - lower)				**Accepted**
Age - information navigation skill	-.11	-.11	-.22	Accepted
Age - operational skill	-.19	-.11	-.30	Accepted
H17b. Age - content-related internet skills (no differences)	-.34	-.17	-.51	**Rejected**
Age - social skill	-.23	-.08	-.31	Rejected
Age - creative skill	-.11	-.09	-.20	Rejected
H18a. Education - medium-related internet skills	.02	.01	.03	**Accepted**
Education - information navigation skill	.16	.04	.20	Accepted
Education - operational skill	.17	.06	.23	Accepted
H18b. Education - content-related internet skills				**Accepted**
Education - social skill	.16	.04	.20	Accepted
Education - creative skill	.18	.05	.23	Accepted
H18d Education - e-government services				**Partly supported**
Education - transactional services	x	x	x	Rejected
Education - informational services	x	x	x	Rejected
Education - communication services	.09	x	x	Accepted
H19a. internet experience - medium-related internet skills				**Partly supported**
internet experience - information navigation skill	x	x	x	Rejected
internet experience - operational skill	.21	x	.21	Accepted
H19b. internet experience - content-related internet skills				**Accepted**
internet experience - social skill	.23	x	.23	Accepted
internet experience - creative skill	.10	x	.10	Accepted

H21a. Income - medium-related skills				**Partly supported**
Income - information navigation skill	x	x	x	Rejected
Income - operational skill	.09	x	.09	Accepted
H21b. Income - content-related skills				**Partly supported**
Income - social skill	.08	x	.08	Accepted
Income - creative skill	x	x	x	Rejected
H21c. Income - e-government services				**Rejected**
Income - transactional services	x	x	x	Rejected
Income - informational services	x	x	x	Rejected
Income - communication services	x	x	x	Rejected
***Behavioral intention is changed for actual use**				
Age - transaction services	-.20			
Age - informational services	-.24			
internet experience - communication services	.17			
Gender - communication services	.10			

4.3 Overview of the hypotheses

The standardized path coefficient in Figures 2, 3 and 4 all shows significant direct and indirect effects across all variables of the conceptual model, except employment rate. The validation of the hypotheses that could be tested by SEM can be found in Table 8. According to the results, 17 out of the 27 hypotheses were (partly) supported. Although not every hypotheses could be tested by the model and 9 hypotheses were rejected, the suggested model provides a moderate explanation for the use of transactional, informational and communication services. The PE has an indirect effect on informational and transactional services, but no effect on communication services, thus H1 is partly supported. PE is an indirect impact on the use of e-government services. EE and SI have an positive impact on the use of informational services and SI also has a positive influence on the use of transactional services; however, on communication services, there were no significant relations confirming H2 and H3. In addition, only an indirect effect was found between PU and the use of informational services, so H4 is partly supported. In addition, PEOU showed an indirect effect on the use of information and transaction services, so H5 is partly supported. In H6, PEOU had an strong direct and indirect effect on PU, supporting this hypothesis. PEOU negatively influences information navigation skills and positively effects operational skill, while no effects were found on the content-related internet skills. PEOU has a positive relation with medium-related internet skills and no relation with content-related skills, thus H8a is accepted and no support is found for H8b. None of the internet skills directly influence any of the three e-government services and only have a small negative effect on information navigation skill, as well as a small positive indirect relation for the use of information services found, resulting in the partial support of H9 + H11a and the rejection of H10a+b and H11b. Concerning receiving support, a positive indirect influence on PEOU was found for people who are not receiving support, resulting in negative indirect support, which results in a rejection of H13. Next, H15 has a positive indirect effects between no support use and use of transactional and informational services. Because the expectation was that use of support would increase the use of online government services, H15 is rejected. Direct effects were found that men are more likely to have better creative skills, via indirect paths, men also have better information navigation, operational and social internet skills. The belief was that there was no gender difference, so H16a and b are rejected. The expectation was that age had a negative influence on medium-related internet skills, which means that H17a is accepted. Conversely, the expectation was that age did not have an effect on content-related internet skills, but it has an negative significant effect, so H17b is rejected. Education has a positive effect on all internet skills, therefore H18a and H18b are accepted. In addition, higher education leads to more use of communication services, but had no effect on the other services, therefore hypothesis H18d is partly supported. People with more internet experience also have better internet skills. This only not apply applies for information navigation skill, where no significant effect was found, partly supporting H19a and fully H19b. Higher income predicts higher operational and social internet skills. Alternatively, income did not influence information navigation and creative skill, resulting in partial support for H21a and H21b. Finally, income did not influence the actual use of any e-government services, so H21c is rejected.

4.4 Extra connections

The SEM model not only shows the relations needed to test the hypotheses, but also reveals other connections. Four interesting connections are revealed by this model. The first two shows that age has a negative influence both, on the use of transactional services and informational services. Thirdly, people with more internet experience use more transactional services. Finally, males use more communication services, compared to women. Many connections between SI, EE, PEOU, PU and PE are interconnected, resulting in more indirect effects in this model.

4.5 Linear and Multiple regression analysis

The data that did not fit for SEM was analyzed by an multiple regression analysis to test the remaining hypotheses and determine answers for the research questions. Hypotheses 7, 12, 14, 16c, 18c and 20 are discussed in this section.

Starting with the first hypothesis, H1: "The level of medium-related internet skills has a positive influence on the level of content-related internet skills". To examine this hypothesis, the average score of information navigation and operational skill were merged into a new variable: medium-related internet skills. Subsequently, social skill and creative skills were merged into: content-related internet skills. The regression analysis revealed that medium-related internet skills significantly predicted content-related internet skills (see Table 10): R^2 = 0.56, F(654,362) = 228,750, p= <0.01. The parameters show the positive impact of medium-related internet skills on content-related internet skills: B=.853, SE= .033, t=25.581, p<.001. This results in the acceptance of H1.

Table 9 H7 Linear regression medium-related internet skills - content-related internet skills

	Unstandardized Coefficients		std. Coefficients Beta		
	B	std. Error	Beta	t	Sig.
(constant)	-.19	.131		-.146	.884
Medium-related internet skills	.853	.033	.747	25.581	.001

Dependent variable: Content-related internet skills

Hypotheses 12a+b are: People receiving social support are associated with lower levels of operational, social and creative internet skills and higher levels of information navigation skill than people that are receiving formal support. To test these hypotheses, people using both support and no support were excluded to filter out overlap. In total, 128 respondents met the requirements. There were no internet skills that were significantly different between these groups, which results in the rejection of H12a+b.

Table 10 H12 Multiple regression analysis support - internet skills

	Unstandardized Coefficients		std. Coefficients Beta		
	B	std. Error	Beta	t	Sig.
(constant)	.710	.126		5.634	.001
Information-navigation	.043	.030	.123	1.421	.158
Operational	.050	.045	.170	1.111	.269
Social	.000	.037	-0,001	-0,006	.995
Creative	.039	.039	.116	1.021	.309

Dependent variable: Formal/informal support

Hypothesis 14, reads: Receiving social support sources is associated with higher SI. This was tested by dividing the participants into two groups; group one used social support and group two did not use social support. The association with SI was tested by a linear regression analysis. There is no significant association found, leading to a rejection of H14.

Table 11 H14 Linear regression analysis social support - SI

	Unstandardized Coefficients		std. Coefficients Beta		
	B	std. Error	Beta	t	Sig.
(constant)	1.721	.073		23.648	.001
SI	-.007	.27	-0,11	-.261	.794

Dependent variable: Social support

4.5.1 Chi-Square analysis

The Chi-Square test was used to examine hypotheses 16c, 18c and 20a-c.

To test hypothesis 16c, "Gender is associated with different support sources," a Chi-Square test is performed. No significant association was found, thus H16c is rejected.

Table 12 H16C Chi-Square test Support source - gender

	x2	df	Sig.
Pearson Chi-Square	5.045a	2	.08
Likelihood Ratio	4.770	2	.092
Linear-by-linear Association	2.217	1	.136
N of Valid Cases	169		

1 cell (16,7%) has expected count less than 5. The minimum expected count is 3,25.

To assess hypothesis 18c, "The level of education attained is associated with an different preference towards support sources," the support sources was divided into: social support, formal support and social and formal support. Education was merged into three groups: low, middle and higher education. These two divisions were analyzed with a Chi-Square test.

Table 13 H18c Chi-Square test support - education

	χ2	df	Sig.
Pearson Chi-Square	24.608a	4	.001
Likelihood Ratio	24.001	4	.001
Linear-by-linear Association	21.442	1	.001
N of Valid Cases	167		

3 cells (33,3%) have expected count less than 5. the minimum expected count is 2,46

Hypothesis 18c is accepted; the level of education (split into low, middle, high) attained is associated with a significant difference in preferred support source is. $\chi 2=(24.608)$, df=4, $p<.001$. However, it must be noted that more than 20% of the cells has a count less than five, which makes the test less reliable. This could be explained by the small sample that is pulled out of the people who claimed to use a support source (167 out of 540). Lower educated people seems to use significantly more social support, whereas higher educated people tend to use more formal support. The combination of social and formal support is significantly more in favor for higher educated people. People that attain average levels of education use each support source as expected by the chi-square test. For a complete overview, see Appendix F.

To test hypotheses 20a+b: "Higher employment rate is associated with higher medium-related internet skills (20a) and content-related internet skills (20b)," employment rate was split into three groups: unemployed, student and employed. The same internet skills variables were used as for hypothesis one: medium- and content-related internet skills. In order to find out if there is a correlation between these group, a linear regression analysis was conducted.

Table 14 H20A Linear regression analysis medium-related internet skills - employment rate

	Unstandardized Coefficients		std. Coefficients Beta		
	B	std. Error	Beta	t	Sig.
(constant)	3.009	.073		41.399	.001
Employment rate	.392	.031	.484	12.593	.001

Dependent variable: Medium-related internet skills

Table 15 H20B Linear regression analysis content-related internet skills - employment rate

	Unstandardized Coefficients		std. Coefficients Beta		
	B	std. Error	Beta	t	Sig.
(constant)	2.390	.085		28.093	.001
Employment rate	.408	.036	.441	11.194	.001

Dependent variable: content-related internet skills

It appears that employment rate positively impacts all internet skills, medium-related internet skills: R^2= .234, F(158,596) = 73,766, p<0.001 and content-related internet skills: R^2= .195, F(125,302) = 79,826, p<0.001. So, the conclusion is that hypotheses 11a+b are both accepted.

For hypothesis 20c, "Employment rates (higher) are associated with formal support sources," a Chi-Square test is conducted.

Table 16 H20C Chi-Square test Support source - employment rate

	χ2	df	Sig.
Perason Chi-Square	15.023a	2	.001
Likelihood Ratio	14.247	2	.001
Linear-bylinear Association	12.896	1	.001
N of Valid Cases	168		

1 cell (16,7%) has expected count less than 5. The minimum expected count is 3.10.
Note: students are excluded from this test because they were underrepresented per cell (<5).

There is a significant difference between employment rate and the use of support. χ2=(15.023), df=2, p<.001. On average, people who are employed use much more formal help and less social help. Also, when people indicate they use both help sources, employed people still use more combined support sources. This indicates a positive influence of employment rate on formal help, which leads to the acceptance of hypothesis 20c.

5. Results

This study has investigated the effects of internet skills and support sources on the use of e-government services, with the aim to get a better insight in what the predictors are for the use of online services from the municipality of Zwolle, based on a conceptual model. To recapitulate, the central research questions were:

"What are the predictors of using e-government services?" and "To what extent does support impacts the use of e-government services among the receivers?"

In order to test these, thirty-seven hypotheses were tested within 18 constructs. In total 23 out of the 37 hypotheses were supported or partly supported. The outcomes of this study will be discussed in the next paragraphs according to topic.

5.1 Main findings

Transaction services

The results of this study show that social pressure from one's closest relations influence if the person will actually use transactional services. Suggesting that more people will use these services if they become more popular. Also, if a person perceive transaction services as easy to use and useful, they will use the services more frequently. This indicates user-friendliness of the online services of the municipality of Zwolle plays a part in how much the services are used. The level of education does not determine whether somebody uses transaction services. In contrast, age has a negative impact on the use of these services.

Information services

Results show that people are directly influenced by others to use these services and the easier they think it is to use or learn e-government services, the more they will use informational services. The reason for this may that informational services are the easiest and most accessible services of all three, making it the most feasible to learn and use.

People who know the basics of how to use the internet (operational skills) also use more informational services. The rest of the internet skills did not show any positive effect on the use of informational services. Someone receiving help is indirectly influence to use informational services. This could mean that people who are asking help, are less self-reliant and therefore are more influenced by others. Income and education level do not affect the use of these services, yet increased age effects the use of these services negatively. This indicates that information services is the most mainstream among the three types of services.

Communication services

Educational level has an direct influence on the use of communication services, suggesting that higher educated people communicate relatively more via the digital channel with the municipality of Zwolle. Plausible is that higher educated people see communication services as a more efficient and beneficial way to communicate with the municipality. This study shows that people who use the internet more often, use more communication services and men use more communication services than women. An explanation for this is that people who are using the internet more frequently, also know how to communicate via the internet. Which makes it easier to communicate with municipality digitally. Next, men use the internet more for communication purposes.

Finally this study showed that on average, the use of transactional services scored much lower than information services and communication services. The lower score on transactional services could be explained by the fact that these services cost more effort and time than communication or informational services, or that people need these services less frequently. On the other hand the recent study of Ebbers, Jansen, and van Deursen (2016) found that different types of services (e.g. registration or consolidation) correlates with different channel preferences (e.g. online or offline). Suggesting that transactional services are possible more in favor of traditional channels like telephone or desk among citizens than information and communication services.

Internet skills

There is a very strong relation between medium-related internet skills and content-related internet skills, suggesting that knowing how to use internet or button knowledge (Bunz, Curry, & Voon, 2007; Hargittai & Hsieh, 2012; Krueger, 2006; Potosky, 2007) impacts the possibility of use and benefits from internet services. Internet experience plays a big part in developing all internet skills, except information navigation skill. This implies that it is easiest to learn information navigation skills with little or no prior experience on the internet. The increasing use of internet devices could mean that people easier familiar with these devices, since internet experience is not needed to develop information navigation skills. The expectation is that people who do not possess any internet skills yet will develop information navigation skills first.

Age is a significant negative Influencer on internet skills and use the of e-government services. This corresponds to the literature and could be explained by the fact that older people did not grow up with internet technologies and are therefore, not familiar with it. The other side is that internet is quite complex and the elderly tend to learn more slowly than young people. This means that for the municipality of Zwolle, internet skills and online services should still be promoted, but in parallel with the traditional channels open to do business with the government, because not all people have the skill or the willingness to learn how to use internet and its available services.

This study concludes that men have better internet skills and that women using more support. This reveals that women are more open to support, but also need more support. When Zwolle wants to facilitate support, it could take into account gender differences. Men use communication services from the municipality more often than woman. Men have better internet skills, which could make it easier for them to communicate via digital channels and therefore make more use of this channel. Another explanation is that men see digital communication as more efficient or beneficial compared to women. This indicates that men can be approached better via digital communication. Furthermore, this could be a topic for future research.

People with higher levels of education have higher internet skills. This indicates that the internet is easier to use for people who have a higher education, and that these people are better positioned to benefit from the opportunities on the internet (Van Deursen & Van Dijk, 2014a; Van Deursen, Van Dijk, & Ten Klooster, 2015). These results could be helpful for municipality of Zwolle when they want to offer internet training or other ways to improve internet skills for people who are lacking these skills. On short term to increase the use of e-government services. People that are higher educated are easier to persuade to use these services, because chances are higher they know how to use these services.

People with higher incomes had better operational and social skills, assuming that people that have higher incomes are also more likely to work, which allows them to further develop these skills and have access to another formal support source. People with high employment rates also have the opportunity for a bigger social life, because their colleagues become a part of it. This could explain why

social skills are higher for this group. The higher operational skills indicate that these skills are needed to perform at the job and are developed during work.

People that are employed have the highest internet skills, followed by students, suggesting that employment will raise someone's internet skills, because one is required to use internet skills to perform in the job. Students with less internet skills than employed people could possess lower skills due to fact that they are younger and therefore have less internet experience. People with less internet experience score lower on internet skills. However, the relation between employment rate and internet experience is not measured in this study.

Contrary to the expectation, people with less information navigation skills, think the use of online services of the municipality will help them to achieve their goal (e.g. they perceived that it is easier to request an passport online and such). This means that people with less information navigation skills perceives online services as more helpful. This shows that people might have a less holistic view of the possibilities of internet and therefore, their expected performance is higher for e-government services.

People with better button knowledge were less influenced by others to use e-government services, which could be explained that these people are more self-reliant. As expected, people with more information navigation skills perceived the use of e-government services as easier and in line with their expectation of the e-government services. As previously mentioned, information navigation are also the easiest skills to learn. When people get help or stimulation to increase these skills, more will perceive the online government services as easier to use, prompting them to use the municipality's online services. Operational skill seems to have a positive relation with PEOU and EE, which is in line with information navigation skills, since they are both medium-related internet skills. The results of this study indicate that people who know how to operate a device to use the internet, also find it easier and more free from effort to use the internet, than those struggling with operational skills. It also reveals that social skills do not influence the actual use of e-government services. The most difficult internet skill to learn, creative skills, has an negative impact on the perception of how well the e-government services performs. This implies that people with more creative skills are more critical towards online government services of the municipality. An explanation could be that these people have more comparison material and therefore judged the e-government services performance as lower.

Support Sources

According to the findings of this study, women use more support than men do. However, when somebody uses support, there is no difference in the preference for the type of support by gender. In line with this theory, the elderly use more support and higher educated people use less support. These findings suggest that indicators for support sources are gender, age and education. When the local government plans to increase internet skills among their inhabitants it is recommended to focus on women, people with lower education and elderly. People that use support also find it harder to use e-government services. Suggesting that people who are looking for help also need it, which is in line with the finding that only 1.7% of the people do not know who to ask for help if needed. No relation was found between actual use and support sources, indicating that the access to help when experiencing difficulties on the internet does not influence the use of e-government services. Moreover, people using support are also more in need of support, because all the internet skills are on average lower for people that are using support. Lower educated people use more social support and higher educated people tend to use more formal support. The combination of use from both support sources is more represented by high educated people. Individuals that attain average-level of education use each support source as expected. As people that are high educated also are more employed on average,

they also have more and easier access to formal support sources. This could explain why the use of formal support and both support sources users is higher when the education level increases. Not as expected, the type of support (e.g. formal or informal) that people choose does not seems to impact the level of internet skills between people that only use formal support or only social support. This indicates that both support systems have the same influence on someone's internet skill. Which is contrary with the results of Van Deursen Courtois and Van Dijk (2014) study. finally, the choice of support does not affect the actual use of e-government services.

Summary of the conceptual model

To recapitulate, this model found enough evidence to predict the use of e-government services; namely, transactional services for 12%, informational services by 21% and communication services by 24%. So, with regard to the research question, this model can explain to some extent what the predictors are for e-government services. Age, gender, internet experience, education, SI and EE have direct influence on some of the e-government services, mediating the actual use of e-government services. This is according the original UTAUT model, with the addition of education. Medium-related internet skills predict most of the TAM and UTAUT variables, making them a good addition to the existing UTAUT model. To revisit the second research question, support does not impact the use of e-government services. Yet, there is significant evidence that people who need support have less internet skills. Finally one third of the people use support, suggesting that support is needed for a large group of people to use the internet. Without the access to internet, no e-government can be used. However, this is not revealed in this study.

Theoretical implications

This study combined parts of the UTAUT model (Venkatesh, et al., 2003), the TAM (Davis, 1989), internet skills (Van Deursen et al., 2014) and support sources (Van Deursen, Courtois, & Van Dijk, 2014) into one new model. It also adds a new measurable construct to actual use of e-government services, replacing use behavior.

Firstly, this study contributes to the theory of social sciences by showing that internet skills are a good contribution to the UTAUT model. The UTAUT is developed to explain the user's intention, the use of information systems and usage behavior (Venkatesh et al. 2003). This study showed that internet skill, especially medium-related internet skills, are a good predictor for the constructs PEOU, SI, EE and PE. Noteworthy, no direct relation between internet skills and use behavior was found. Furthermore, the results show that the level of education is a good mediator for actual use, which contributes to the existing UTAUT model.

Secondly, this paper adapted several UTAUT and TAM constructs to the context of e-government services and proved to be successful. PE was the only construct with middle internal consistency (α=.51). The other constructs seems to fit well to the context of e-government services: PEOU (α=.91), PU (α=.82), EE (α=.88), SI (α=.74).

Thirdly, the replacement of use behavior for actual use of e-government services. This new construct contains information, transaction and communication online services for the Zwolle municipality, based on the division of Aichholzer (2001). It had a combined Cronbach's alfa of .74 (α=.74) This new construct proved to be a reliable and valid construct to measure actual use of e-government services.

Finally, findings from this study suggest adding the level of education and, where applicable, internet skills to the UTAUT model to better measure use of e-government services in the Netherlands. The new construct is recommended and potentially also useful outside the Netherlands.

Discussion

The basis of the conceptual model is the UTAUT model of Venkatesh et al. (2003). This model addresses the intention to use a technology and tries to predict usage behavior. In this study, the actual use was measured, which made the behavioral intention less valuable. Therefore the researcher decided to replace behavioral intention, which lead to usage behavior, with actual use. However this means the complete model was not used and the theory did not match completely with the model. Furthermore, the items for predictors of actual use were about e-government services in general, while the actual use was measured specifically for three different services. This makes the predictor constructs less valid, meaning they should be adapted to each specific service in future research. The beneficial part of this choice is that it revealed very clear what the predictors are for each service. Despites the questions of the predictor being focused on general services, they still reasonably explain the actual use. The expectation is that if the items are adjusted for each specific service, the relations will be stronger. In addition, adjusting these items will reveal more relations and latent variables. Also, the predictable power will probably be higher as will the explanatory factor. The conceptual model also include internet skills as an variable to predict E-government services. Although the use of internet requires internet skills. (Van Deursen, Helsper, and Eynon (2014) it was not a predictor for the use of e-government services. This is in line with the recent study of Ebbers, Jansen, and van Deursen (2016). They studied channel preference within e-government services and concluded that the use of e-government did not increase with more internet skills. However they find a positive relations between internet skills and satisfaction of e-government services. This suggest that the use of e-government services will not increase by focusing on internet skills and makes this less relevant for predicting the use of e-government services. However for those inhabitants of Zwolle that do not yet possess these skills it can still be useful to learn these skills. Furthermore it is plausible that people with more internet skills experience fewer difficulties in using e-government services and use it more often because they are more satisfied with the services. In addition support do not seem to influence the actual use of e-government services. On the other hand one third of the people need support with the use of internet. If these people start using the internet more often (with support) their experience will increase which lead to better internet skills and the use of communication services. As this study found a relation between social influence and use of e-government services, making social support a potential indirect influence for use of e-government services. This suggest that facilitating the use of internet, for example by making internet devices available for everyone or to stimulate to help each other to use the internet. The overall internet experience of the inhabitant will grow which ultimately lead to more use of online services. Although not investigated in this study, it seems that ever since studies about internet use have been done since the 2000's. Elderly do not keep up with the new technology and therefore it is recommended to look for efficiency improvements of the other channels (e.g. telephone, desks etc.) to offer government services.

5.2 Directions of future research

This study is the first to combine high quality (in terms of validity and reliability) internet skills constructs with the UTAUT model, which leads to some suggestions for future research. First, this study was conducted in the municipality of Zwolle. Replicating this study in another municipality in the Netherlands or in another country would allow for a cross-country analysis. Increasingly, digital services offered by companies and other organizations make the relationship between internet skills and the UTAUT model an interesting combination to future research. Governments and municipalities have to work as efficient as possible, so offering their services online is more cost-efficient. Still, not all people are capable of using the internet, or are not motivated to use online services. Most government organizations in the Netherlands have focused on making all services available online, but did not spend the necessary resources on user-friendliness or adaption of the services to the target group. For

further research, a study on the user-friendliness and accessibility of the services would be interesting. In addition, channel preference can be studied or added to the conceptual model. It can measure the impact of channel preference on the different types of e-government services. For example to figure out if people use particular services via the internet because it is the only channel were it is available, or is the result that some people maybe neglect to use the service?

One third of the people in the municipality of Zwolle use support with internet. This is a very large group and not much research has been done about this topic. Governments have to be more cost-efficient and people need greater digital skill to benefit from the rapidly growing internet. It would be interesting for both parties to do elaborated research about support sources and how this can increase the use of online services. A similar concept could be applied to research for companies that are engaging in online sales.

This study aimed to predict the use of e-government services using the conceptual model and analyzing it with the SEM. However, the questions of the predictor of actual use: PEOU, PU, SI, EE and PE, were not adjusted to the specific services. For example, the item should be, “Do you think requesting an passport online is ease for me?“ instead of “Do you think online government services are ease to use?” To conduct the research this way, a much larger sample size is required. When the resources are available, the advantage is that more relations in the model could be tested and the model would be more accurate. Not every hypotheses could can be tested via the SEM because some construct did not fit well in the SEM, for example, the questions about socio-economic status. Future research should eliminate or adjust those questions beforehand.

Finally the effect of literacy on the use of online services would be very interesting for further research. With the use of the developed model in this report, literacy can easily be added to investigate this topic.

5.3 Limitation

When interpreting this research some limitations need to be addressed. First the research model combined the UTAUT model and TAM, whereas the constructs of TAM overlaps the constructs of UTAUT model (e.g. PEOU and EE) this could have led to measuring the same construct within those constructs. In addition this research did not include behavioral intention while most constructs lead to behavioral intention and not directly to use according to the theory. It could be that questions measuring intention to use instead of the actual use will lead to more relations, since the current study has not a lot of direct relations to actual use of e-government services.

Furthermore some construct from both models were deleted. The items of the predictors from the conceptual model (e.g. PEOU, EE, SI, PU and PE) focused on general online services of the municipality of Zwolle whereas the actual use was tested separately and more specific per service, which could have led to less accurate results. The sample size was too small to test all the relations with SEM and also too small for testing the constructs for each specific service (e.g. information/transaction /communication services) To test this 5 to 10 observations per estimated parameter is recommended by (Bentler & Chou, 1987; Bollen, 1989). Translating to this study it requires between 1335 and 2670 respondents when adjusting the item for transactional, informational and communication services.

The aim was to measure the complete model with SEM, however not all constructs fit to the model. This could have been prevented if the items were adjusted to fit in SEM. In addition the sample was too small for measuring all relations within the model. However using SEM is a better way for measuring the relations than for example an multiple regression analysis because it consist out of several analyses (Kline, 2011).

Not all questions were filled in at the written questionnaire, which do not work well for the SEM, so the missing values were replaced with the average score per item. Resulting in a more regression to the mean score. There was an bias for the collection of data. People received a letter per household containing one questionnaire, so only one person per household could fill it in, which could led that some people filled it in together. Furthermore people also had the possibility to fill in the questionnaire online and offline if they wanted, which result in an double count for one person. To prevent misuse of internet questionnaire every household got an unique number that they had to fill in. Furthermore the item-scales used for this survey were in general based on previously validated items and scale in English. Some items were adapted to fit in the context of this research. This could lead to different interpretation of the items. Internet skills was measured cross-country before in The Netherlands and England (Van Deursen, Helsper, & Eynon, 2014). The new developed construct have as shortcoming that it is only a selection of the total amount of services in the particular service, while for example transactional services has much more services than four. The selection of chosen services are a fine selection based on elaborative research and conversation in collaboration with the research department of the municipality of Zwolle, plus the internal correlation is quite high (α.74). Lastly, concerning the external validity, the results of these studies are limited to evidence from the municipality of Zwolle. When generalizing these study's results one should be cautiously outside the Netherlands, especially outside the European union, due to possible cultural differences.

6. References

Aichholzer, G. (2001). *E-government: the hard way from political agendas to service improvements.* Vienna, Austria: Institute of Technology Assessment.

Abascal, J., Barbosa, S. D., Nicolle, C., & Zaphiris, P. (2015). Rethinking universal accessibility: a broader approach considering the digital gap. *Universal Access in the Information Society*, *15*(2), 1-4.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour.* Englewood Cliffs, New Jersey: Prentice Hall.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl, & J. Beckmann (Eds.), *Action control* (pp. 11-39). Heidelberg, Germany: Springer Verlag.

AlAwadhi, S., & Morris, A. (2008, January). The Use of the UTAUT Model in the Adoption of E-government Services in Kuwait. In S. AlAwadhi, & A. Morris (Eds.), *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual* (pp. 219-219). Washington, USA: IEEE.

Bandalos, D. L., & Finney, S. J. (2001). Item parceling issues in structural equation modeling. In G. A. Marcoulides, & R. E. Schumacker (Eds.), *New developments and techniques in structural equation modeling* (pp. 269-296). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Barzilai-Nahon, K. (2006). Gaps and bits: Conceptualizing measurements for digital divide/s. *The information society*, *22*(5), 269-278.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological bulletin*, *107*(2), 238.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological bulletin*, *88*(3), 588.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods & Research*, *16*(1), 78-117.

Berry, L. L. (1980). Services marketing is different. *Business*, *30*(3), 24-29.

Bitner, M. J., Brown, S. W., & Meuter, M. L. (2000). Technology infusion in service encounters. *Journal of the Academy of marketing Science*, *28*(1), 138-149.

Bollen, K. A. (1989). A new incremental fit index for general structural equation models. *Sociological Methods & Research*, *17*(3), 303-316.

Buente, W., & Robbin, A. (2008). Trends in internet information behavior, 2000–2004. *Journal of the American Society for Information Science and Technology*, *59*(11), 1743-1760.

Bunz, U., Curry, C., & Voon, W. (2007). Perceived versus actual computer-email-web fluency. *Computers in Human Behavior, 23*(5), 2321-2344.

Cahoon, B. (1998). Teaching and learning internet skills. *New Directions for Adult and Continuing Education*, *1998*(78), 5-13.

Calvani, A., Fini, A., Ranieri, M., & Picci, P. (2012). Are young generations in secondary school digitally competent? A study on Italian teenagers. *Computers & Education, 58*(2), 797-807.

Carter, L., & Bélanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information systems journal*, *15*(1), 5-25.

Cohen, J. (1988). *Statistical analysis for the behavioral sciences*. Hillsdale, USA: Lawrence Erlbaum.

Compaine, B. M. (2001). *The digital divide: Facing a crisis or creating a myth?* Cambridge, MA: The Mit Press. (p. xi)

Cooper, J. (2006). The digital divide: The special case of gender. *Journal of Computer Assisted Learning*, *22*(5), 320-334.

Cotten, S. R., & Jelenewicz, S. M. (2006). A disappearing digital divide among college students? Peeling away the layers of the digital divide. *Social Science Computer Review*, *24*(4), 497-506.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, *13*(3), 319-340.

Davis, P. M. (2003). Effect of the web on undergraduate citation behavior: guiding student scholarship in a networked age. *portal: Libraries and the Academy*, *3*(1), 41-51.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, *35*(8), 982-1003.

DeVellis, R. F. (2012). *Scale Development: Theories and Applications* (3rd ed.). Thousand Oaks, CA: SAGE.

De Haan, J., & Huysmans, F. (2002). Differences in time use between internet users and non-users in The Netherlands. *IT & Society*, *1*(2), 67-85.

De Haan, J., Huysmans, F., & Steyaert, J. (2002). *At Home in a Digital World: Acquiring Digital Skills between Home and School.* The Hague, The Netherlands: Social and Cultural Planning Agency.

Dijkstra, W., & Smit, J. (1999). *Onderzoek met vragenlijsten: een praktische handleiding.* Amsterdam, The Netherlands: VU uitgeverij.

DiMaggio, P., & Hargittai, E. (2001). *From the 'digital divide' to 'digital inequality': Studying internet use as penetration increases.* Princeton, USA: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University. Retrieved from http://www.princeton.edu/~artspol/workpap/WP15%20-%20DiMaggio%2BHargittai.pdf

DiMaggio, P., Hargittai, E., Celeste, C., & Shafer, S. (2004). From unequal access to differentiated use: A literature review and agenda for research on digital inequality. In K. Neckermann (Ed.), *Social inequality* (pp. 355-400). New York, USA: Russell Sage Foundation.

Dooley, K. (2001). Social research methods. In *4 th ed. Upper Saddle River, NJ*.

Ebbers, W. E., Jansen, M. G., & van Deursen, A. J. (2016). Impact of the digital divide on e-government: Expanding from channel choice to channel usage. *Government information quarterly*, *33*(4), 685-692.

Ebbers, W. E., Pieterson, W. J., & Noordman, H. N. (2008). Electronic government: Rethinking channel management strategies. *Government Information Quarterly*, *25*(2), 181-201.

Escobar-Rodríguez, T., & Carvajal-Trujillo, E. (2014). Online purchasing tickets for low cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model. *Tourism Management*, *43*, 70-88.

Eshet-Alkalai, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, *13*(1), 93.

Evans, J. D. (1996). *Straightforward statistics for the behavioral sciences*. Pacific Grove, CA: Brooks/Cole Publishing Company.

Ferrari, A. (2012). *Digital Competence in practice: An analysis of frameworks.* Sevilla, Spain: JRC IPTS. doi:10.2791/82116.

Gisler, M., & Spahni, D. (2001). eGovernment-Eine Standortbestimmung. Bern/Stuttgart/Wien, Switzerland/Germany/Austria: Paul Haupt.

Goldin, C. D., & Katz, L. F. (2009). *The race between education and technology*. Cambridge, USA: Harvard University Press.

Goulding, A., & Spacey, R. (2002). Women and the Information Society: barriers and participation. *Ifla journal*, *29*(1), 33-40.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2006). *Multivariate data analysis* (6th ed.) prentice hall. *New Jersey*.

Hargittai, E. (2002, April 01). Second-level digital divide: mapping differences in people's online skills. *First Monday, 7*(4). Retrieved from http://firstmonday.org/issues/issue7_4/hargittai/index.html

Hargittai, E., & Hinnant, A. (2008). Digital inequality differences in young adults' use of the internet. *Communication Research*, *35*(5), 602-621.

Hargittai, E., & Hsieh, Y. P. (2012). Succinct survey measures of web-use skills. *Social Science Computer Review, 30*(1), 95-107.

Hargittai, E., & Shafer, S. (2006). Differences in actual and perceived online skills: The role of gender. *Social Science Quarterly*, *87*(2), 432-448.

Haythornthwaite, C. (2007). Social networks and online community. In A. Joinson (Ed.), *The Oxford handbook of internet psychology* (pp. 121-137). Oxford, England: Oxford University Press.

Helsper, E. (2008). *Digital inclusion: an analysis of social disadvantage and the information society*. London, England: Department for Communities and Local Government.

Helsper, E., & Eynon, R. (2013). Distinct skill pathways to digital engagement. *European Journal of Communication, 28*(6), 696-671.

Hooper, D., Coughlan, J., & Mullen, M. (2008, January 01). Structural equation modelling: Guidelines for determining model fit. *Journal of Business Researchs Methods, 6*(1), 53-60. Retrieved from https://www.researchgate.net/publication/254742561_Structural_Equation_Modeling_Guidelines_for_Determining_Model_Fit

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). The Racial Digital Divide: Motivational, Affective, and Cognitive Correlates of internet Use1. *Journal of applied social psychology*, *31*(10), 2019-2046.

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robinson, A. J. (2009). *Confronting the challenges of participatory culture. Media education for the 21st century.* Cambridge, USA: The MIT Press.

Kaplan, D. (2007). Structural Equation Modeling. Sage, (2nd ed) Sage Publishing pp. 1089–1093.

Katz, J., & Aspden, P. (1997). Motivations for and barriers to internet usage: Results of a national public opinion survey. *internet Research*, *7*(3), 170-188.

Kline, R. B. (2011). *Convergence of structural equation modeling and multilevel modeling*. na.

Kotler, P. (2000). Marketing management: The millennium edition. *Marketing Management*, *23*(6), 188-193.

Kozma, R. B. (2003). Technology and classroom practices: An international study. *Journal of Research on Technology in Education*, *36*(1), 1-14.

Krueger, B. S. (2006). A comparison of conventional and internet political mobilization. *American Politics Research, 34*(6), 759-776.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & management*, *40*(3), 191-204.

Litt, E. (2013). Measuring users' internet skills: A review of past assessments and a look toward the future. *New Media & Society, 15*(4), 612-630.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New media & society*, *9*(4), 671-696.

MacCallum, R. C., & Austin, J. T. (2000). Applications of structural equation modeling in psychological research. *Annual review of psychology*, *51*(1), 201-226.

Mossberger, K., Tolbert, C. J., & Stansbury, M. (2003). *Virtual Inequality: Beyond the Digital Divide.* Washington, DC: Georgetown University Press.

Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). Evaluation of goodness-of-fit indices for structural equation models. *Psychological bulletin*, *105*(3), 430.

Ono, H., & Zavodny, M. (2007). Digital inequality: A five country comparison using microdata. *Social Science Research*, *36*(3), 1135-1155.

Potosky, D. (2007). The internet knowledge (iKnow) measure. *Computers in Human behavior, 23*(6), 2760-2777.

Ramaswamy, R. (1996). *Design and management of service processes: keeping customers for life*. Boston, USA: Addison-Wesley.

Reisdorf, B. C. (2011). Non-adoption of the internet in Great Britain and Sweden. A cross-national comparison. *Information, Communication & Society*, *14*(3), 400–420.

Rice, R. E., McCreadie, M., & Chang, S. J. L. (2001). *Accessing and browsing information and communication*. Cambridge, USA: Mit Press.

Robinson, J. P., DiMaggio, P., & Hargittai, E. (2003). New social survey perspectives on the digital divide. *It & Society*, *1*(5), 1-22.

Scheepers, A., & Kommers, C. (1994). De overheid als dienstverlenende instelling. *Zuurmond, A. Frissen, P.H.A., Huigen J,. Snellen I.T.M. and Top .S.P.W.(Eds.), Informatisering in het openbaar bestuur. Den Haag, The Netherlands: Vuga*.

Schumacher, P., & Morahan-Martin, J. (2001). Gender, internet and computer attitudes and experiences. *Computers in human behavior*, *17*(1), 95-110.

Selwyn, N., Gorard, S., & Furlong, J. (2006). *Adult learning in the digital age: Information technology and the learning society*. Oxford: UK Routledge.

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual differences*, *42*(5), 893-898.

Van Deursen, A. J., Bolle, C. L., Hegner, S. M., & Kommers, P. A. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in human behavior*, *45*, 411-420.

Van Deursen, A. J., Courtois, C., & Van Dijk, J. A. (2014). internet skills, sources of support, and benefiting from internet use. *International journal of human-computer interaction*, *30*(4), 278-290.

Van Deursen, A. J., & Helsper, E. J. (2015). The third-level digital divide: who benefits most from being online?. In *Communication and information technologies annual* (pp. 29-52). Bingley, UK: Emerald Group Publishing Limited.

Van Deursen, A. J. A. M., Helsper, E. J., & Eynon, R. (2014). *Measuring Digital Skills: From Digital Skills to Tangible Outcomes project report.* Oxford, UK: University of Oxford. doi: 10.13140/2.1.2741.5044

Van Deursen, A., & Van Dijk, J. (2011). internet skills and the digital divide. *New media & society*, *13*(6), 893-911.

Van Deursen, A. J., & Van Dijk, J. A. (2014a). The digital divide shifts to differences in usage. *New media & society*, *16*(3), 507-526.

Van Deursen, A. J., & Van Dijk, J. A. (2015). Toward a multifaceted model of internet access for understanding digital divides: An empirical investigation.*The Information Society*, *31*(5), 379-391.

Van Deursen, A. J., Van Dijk, J. A., & Peters, O. (2011). Rethinking internet skills: The contribution of gender, age, education, internet experience, and hours online to medium-and content-related internet skills. *Poetics*, *39*(2), 125-144.

Van Deursen, A. J., Van Dijk, J. A., & Ten Klooster, P. M. (2015). Increasing inequalities in what we do online: A longitudinal cross sectional analysis of internet activities among the Dutch population (2010 to 2013) over gender, age, education, and income. *Telematics and informatics*, *32*(2), 259-272.

Van Dijk, J. A. G. M. (2005). *The Deepening Divide Inequality in the Information Society.* London, UK: Sage Publications.

Van Dijk, J. A. G. M. (2006). Digital divide: Research, achievements and shortcomings. *Poetics, 34*(4-5), 221–235.

Van Dijk, J. A. G. M., Hanenburg, M. H. N., Pieterson, W. J., & Van Dijk, C. J. (2006). *Gebruik Van Nederlandse elektronische overheidsdiensten in 2006*. Enschede, The Netherlands: Universiteit Twente.

Van Dijk, J. A. G. M., & Van Deursen, A. J. A. M. (2014b). *Digital skills, unlocking the information society*. New York, USA: Palgrave Macmillan.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision sciences*, *39*(2), 273-315.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, *46*(2), 186-204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, *27*(3), 425-478.

Venkatesh, V., & Zhang, X. (2010). Unified theory of acceptance and use of technology: U.S. vs. China. *Journal of Global Information Technology Management*, *13*(1), 5-27.

Wasserman, I. M., & Richmond-Abbott, M. (2005). Gender and the internet: Causes of variation in access, level, and scope of use. *Social science quarterly*, *86*(1), 252-270.

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

Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): a literature review. *Journal of Enterprise Information Management*, *28*(3), 443-488.

Volman, M., Van Eck, E., Heemskerk, I., & Kuiper, E. (2005). New technologies, new differences. Gender and ethnic differences in pupils' use of ICT in primary and secondary education. *Computers & Education*, *45*(1), 35-55.

Yu, C. S. (2012). Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model. *Journal of Electronic Commerce Research*, *13*(2), 104.

Zickuhr, K., & Madden, M. (2012, June 06). *Older adults and internet use*. Washington, USA: Pew internet & American Life Project. Retrieved from http://www.pewinternet.org/2012/06/06/older-adults-and-internet-use/

Zillien, N., & Hargittai, E. (2009). Digital distinction: Status-specific types of internet usage. *Social Science Quarterly*, *90*(2), 274-291.

7. Appendices

7.1 Appendix A: Means, standard deviations, and reliability

	Mean	SD
Perceived Ease of Use (five-point scale) α = 0.91	3.40	0.83
1. Het gebruik Van internetdiensten Van de gemeente Zwolle kost weinig mentale inspanning	3.42	0.96
2. Ik vind internetdiensten Van de gemeente Zwolle gemakkelijk om te gebruiken	3.39	0.88
3. Het gebruik Van internetdiensten Van de gemeente Zwolle is helder en begrijpelijk	3.40	0.85
Perceived Usefulness (five-point scale) α = 0.82	3.05	0.75
1. internetdiensten Van de gemeente Zwolle vergroten mijn productiviteit	2.85	0.90
2. Door gebruik te maken Van internetdiensten Van de gemeente Zwolle kan ik meer bereiken dan zonder deze diensten	3.00	0.91
3. internetdiensten Van de gemeente Zwolle maken het mogelijk om mijn taken sneller te behalen	3.32	0.81
Social influence (five-point scale) α = 0.74	2.55	0.73
1. Mensen die invloed hebben op mijn gedrag vinden dat ik gebruik moet maken Van internetdiensten Van de gemeente Zwolle	2.36	0.97
2. Ik gebruik internetdiensten Van de gemeente Zwolle, omdat iedereen in mijn omgeving dat doet	2.17	0.94
3. Als je bij de tijd wil blijven, moet je internetdiensten Van de gemeente Zwolle gebruiken	3.12	1.00
4. Mensen die belangrijk voor mij zijn vinden dat ik internetdiensten Van de gemeente Zwolle moet gebruiken	2.56	0.96
Effort Expectancy (five-point scale) α = 0.88	3.47	0.83
1. Het is makkelijk voor mij om te leren hoe ik internetdiensten Van de gemeente Zwolle moet gebruiken	3.57	0.98
2. internetdiensten Van de gemeente Zwolle zijn over het algemeen makkelijk om te gebruiken	3.44	0.83
3. Het kost mij weinig energie om internetdiensten Van de gemeente Zwolle te gebruiken	3.42	0.94
Performance Expectancy (five-point scale) α = 0.51	3.20	0.61
1. internetdiensten Van de gemeente Zwolle zijn moeilijker dan diensten Van de gemeente Zwolle via de telefoon	2.46	0.96
2. Ik vind internetdiensten Van de gemeente Zwolle nuttig om te gebruiken	3.40	0.93
3. Ik vind internetdiensten Van de gemeente Zwolle handig om mijn zaken met de gemeente te regelen	3.52	0.95

4. internetdiensten Van de gemeente Zwolle zorgen ervoor dat ik sneller mijn zaken heb geregeld met de gemeente	3.46	0.90
Information Navigation Skills (five-point scale) α = 0.79	3.86	0.80
1. Ik vind het moeilijk een website die ik eerder bezocht heb, terug te vinden	4.11	1.11
2. Soms zit ik op een website zonder dat ik weet hoe ik er kwam	3.94	1.03
3. Ik vind het moeilijk om te besluiten wat de beste zoekwoorden zijn	3.91	1.05
4. Ik vind informatie zoeken op internet vermoeiend	3.89	1.11
5. Ik vind de manier waarop veel websites zijn ontworpen verwarrend	3.49	1.01
Operational Skills (five-point scale) α = 0.88	3.83	1.02
1. Ik weet hoe ik sneltoetsen kan gebruiken (bijvoorbeeld CTRL-c voor kopiëren)	3.50	1.34
2. Ik weet hoe ik een website kan bookmarken (toevoegen aan de favorieten)	3.52	1.50
3. Ik weet hoe ik opgeslagen bestanden kan openen	4.14	0.98
4. Ik weet hoe ik een nieuw venster open in mijn internetbrowser	4.10	1.10
5. Ik weet hoe ik een foto Van het internet kan opslaan	4.01	1.11
Social Skills (five-point scale) α = 0.87	3.83	0.99
1. Ik zorg dat mijn commentaar en gedrag passen bij de situatie waarin ik mij op internet bevind	3.76	1.27
2. Ik weet hoe ik kan aanpassen, met wie ik informatie deel (bijvoorbeeld vrienden, vrienden Van vrienden, of iedereen)	3.54	1.32
3. Ik weet welke informatie ik wel of niet kan delen op internet	3.95	1.07
4. Ik weet wanneer ik informatie wel of niet kan delen op internet	3.97	1.07
5. Ik weet hoe ik vrienden uit mijn contactlijst kan verwijderen	4.08	1.05
Creative Skills (five-point scale) α = 0.80	2.69	0.96
1. Ik weet hoe ik een website kan maken	2.19	1.23
2. Ik zou me zelfverzekerd voelen bij het op internet plaatsen Van zelf gemaakte video's	2.44	1.26
3. Ik weet hoe ik kleine aanpassingen kan maken aan materiaal dat anderen hebben gemaakt	2.99	1.32
4. Ik weet hoe ik iets nieuws kan maken Van bestaande online plaatjes, muziek of video's	2.82	1.38
5. Ik weet welke (kopieer)rechten Van toepassing zijn op online materiaal	3.10	1.14

	Ja	Nee

Support Sources N=538

Heeft u wel eens hulp nodig bij het gebruik Van internet?	174 (32,3%)	364 (67,7%)

Wanneer ik hulp nodig heb dan vraag ik:	N	%***
1. Buurtgenoten	8	4.6
2. Vrienden, familie of overige kennissen	157	90.8
3. Vraag ik mensen Van de bibliotheek	2	1.2
4. Een computerexpert of helpdesk	31	17.9
5. Vraag ik een collega op het werk of een studiegenoot	17	9.8
6. Volg ik een internetcursus of training	4	2.3
7. Weet ik niet wie ik om hulp moet vragen	3	1.7

***Note: the total is higher than 100% because multiple answer could be given.

	Mean	SD
Online Government Services dichotomous α = 0.74	2.91	2.39
Transactional services (max. 4)	0.42	0.79
Informational services (max. 4)	1.26	1.20
Communicational services (max. 4)	1.23	1.03

7.2 Appendix B: Adaption of the UTAUT constructs

Construct	Definition	Original Item	Author and Cronbach's alpha	Adapted Item
Perceived usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance (Venkatesh et al., 2003)	1. Using the system in my job increases my productivity	Davis et al. (1999) Cronbach's alpha: ≥0.87	1. internetdiensten Van de gemeente Zwolle vergroten mijn productiviteit
		2. Using the system would enhance my effectiveness on the job		2.Door gebruik te maken Van internetdiensten Van de gemeente Zwolle kan ik meer bereiken dan zonder deze diensten
		3. Using the system in my job would enable me to accomplish tasks more quickly		3. internetdiensten Van de gemeente Zwolle maken het mogelijk om mijn taken sneller te behalen
Perceived ease of use	The degree to which a person believes that using a system would be free of effort (Venkatesh et al., 2003)	1. Interacting with the system does not require a lot of my mental effort	Davis et al. (1999) Cronbach's alpha: ≥0.91	1. Het gebruik Van internetdiensten Van de gemeente Zwolle kost weinig mentale inspanning
		2. I find the system to be easy to use		2. Ik vind internetdiensten Van de gemeente Zwolle gemakkelijk om te gebruiken
		3. My interaction with the system is clear and understandable		3. Het gebruik Van internetdiensten Van de gemeente Zwolle is helder en begrijpelijk
Social Influence	The degree to which an individual perceives that important others belive he or she should use the new system (Venkatesh et al., 2003)	1. People who influence my behavior think that I should use the system	Venkatesh and Davis (2000) ; Yu (2012) Cronbach's alpha: ≥0,77	1. Mensen die invloed hebben op mijn gedrag vinden dat ik gebruik moet maken Van internetdiensten Van de gemeente Zwolle
		2. I use the system because of the pro-portion of coworkers who use the system		2. Ik gebruik internetdiensten Van de gemeente Zwolle, omdat iedereen in mijn omgeving dat doet
		3. Having the system is a status symbol in my organization		3. Als je bij de tijd wil blijven, moet je internetdiensten Van de gemeente Zwolle gebruiken
		4. People that are important to me think that I should use the system		4. Mensen die belangrijk voor mij zijn vinden dat ik internetdiensten Van de gemeente Zwolle moet gebruiken
Effort Expactancy	The degree of ease associated with the use of the system (Venkatesh et al., 2003)	1.Learning to operate the system is ease for me	Venkatesh et al. (2003); Yu (2012) Cronbach's alpha: ≥0,94	1. Het is makkelijk voor mij om te leren hoe ik internetdiensten Van de gemeente Zwolle moet gebruiken
		2.I would find the system easy to use		2. internetdiensten Van de gemeente Zwolle zijn over het algemeen makkelijk om te gebruiken
		3. I would find the system ease to use		3. Het kost mij weinig energie om internetdiensten Van de gemeente Zwolle te gebruiken
Performance expectancy	The degree to which an individual believes that using the system will help	1. Using the system enables me to accomplish tasks more quickly	Venkatesh et al. (2003) Yu (2012) Cronbach's alpha: ≥0,70	1.internetdiensten Van de gemeente Zwolle zijn moeilijker dan diensten Van de gemeente Zwolle via de telefoon

	him or her to attain gains in job perfromance (Venkatesh et al., 2003)	2. I would find the system useful in my job.		2. Ik vind internetdiensten Van de gemeente Zwolle nuttig om te gebruiken
		3. Using the system would make it easier to do my job.		3. Ik vind internetdiensten Van de gemeente Zwolle handig om mijn zaken met de gemeente te regelen
		4. Using the system increases my productivity		4. internetdiensten Van de gemeente Zwolle zorgen ervoor dat ik sneller mijn zaken heb geregeld met de gemeente
Behavioral Intention	An individual's intention to use a particluar device or technology (Venkatesh & Davis, 2000)	1. I intend to use the system in the next <n> monts	Venkatesh and Zhang (2010) Yu(2012) Cronbach's alpha ≥ 0,84	1. Ik heb de intentie om internetdiensten Van de gemeente Zwolle binnen de komende 6 maanden te gaan gebruiken
		2. I plan to use the system in the next <n> months		2. Ik ben Van plan om de komende 6 maanden internetdiensten Van de gemeente Zwolle te gaan gebruiken
		3. I predict I would use the system in the next <n> months		3. Ik verwacht dat ik in de toekomst gebruik ga maken Van de internetdiensten Van de gemeente Zwolle

7.3 Appendix C: Introduction Research

Fijn dat u mee wilt werken aan dit onderzoek van de gemeente Zwolle.

De gemeente Zwolle wil graag meer inzicht krijgen in het gebruik van internetdiensten via www.zwolle.nl. Daarnaast zijn wij benieuwd naar de behoefte aan ondersteuning bij het gebruik van deze internetdiensten. Uw mening helpt ons, om onze dienstverlening en ondersteuning toegankelijker te maken.

- U kunt de vragenlijst invullen tot **28 april 2017**.
- De gemeente Zwolle houdt zich aan de Wet Bescherming Persoonsgegevens. Uw antwoorden worden altijd geanonimiseerd verwerkt.
- Hebt u nog vragen? Neem dan contact op met Onderzoek & Informatie van de gemeente Zwolle, via kcc@zwolle.nl of via telefoonnummer 14038.

7.4 Appendix D: Introduction Letter

Stadskantoor
Lübeckplein 2
Postbus 10007
8000 GA Zwolle
Telefoon 14038
kcc@zwolle.nl
www.zwolle.nl

Retouradres: Postbus 10007, 8000 GA Zwolle

«brief_naam»
«brief_straat»
«brief_plaats»

Behandeld door Programma dienstverlening
Datum 5 april 2017
Onderwerp Onderzoek 'Zwolle digitaal vaardig'

Beste «aanhef» «brief_naam»,

De gemeente Zwolle wil alle inwoners zo snel en zo goed mogelijk helpen. Dit willen we onder andere realiseren door steeds meer producten en diensten online aan te bieden.

Het doel is om deze online diensten voor zoveel mogelijk inwoners toegankelijk te maken, zodat iedereen hiervan kan profiteren. Het regelen van gemeentezaken via internet heeft over het algemeen veel voordelen. Maar we weten ook dat (nog) niet iedereen hiervan gebruik kan maken en daar willen we wat aan doen.

De gemeente Zwolle heeft een masterstudent van de Universiteit Twente gevraagd onderzoek te doen op dit gebied. De uitkomsten van dit onderzoek zullen worden gebruikt bij de keuzes die de gemeente Zwolle maakt om de digitale dienstverlening beter toegankelijk te maken. Daarom is uw medewerking belangrijk voor ons.

Als dank voor uw tijd en inzet verloten we 3 VVV-bonnen van 25 euro onder de deelnemers!

Meedoen kan op twee manieren:

1. U kunt de vragenlijst via internet invullen:
   - Ga naar **www.zwolle.nl/onderzoek** (via de adresregel, niet via Google)
   - Klik op: Onderzoek 'Zwolle digitaal vaardig'
   - Log in met de volgende persoonlijke codes:

   Project ID: **«Project_ID»**
   Wachtwoord: **«Password»**

2. U kunt ook de schriftelijke vragenlijst invullen en terugsturen in de bijgevoegde antwoordenvelop.

Het invullen van de vragenlijst duurt ongeveer 15 à 20 minuten en kan tot **28 april 2017**. Uw antwoorden worden altijd geanonimiseerd verwerkt.

Datum 5 april 2017

Heeft u vragen naar aanleiding van het onderzoek, dan kunt u bellen naar 14038 of een mail sturen aan kcc@zwolle.nl.

Alvast hartelijk bedankt voor uw deelname.

Met vriendelijke groet,

Netty Deelen
Programmamanager Dienstverlening
Gemeente Zwolle

7.5 Appendix E Correlations analysis outcome

Correlations

		Support	Trans.Serv.	Info.Serv.	Comm.serv	Dienst_Tot	EE	PE	PEOU	PU	BI	SI	InfoNav.Skil	OperationalSk	SocialSkill	CreativeSkil	Age	Gender	Education	InternetExp	socialEcon.	Income	DigiD_
Support	Pearson Correl	1																					
	Sig. (2-tailed)																						
	N	540																					
Trans.Serv.	Pearson Correl	-,186**	1																				
	Sig. (2-tailed)	0,000																					
	N	536	536																				
Info.Serv.	Pearson Correl	-,214**	,382**	1																			
	Sig. (2-tailed)	0,000	0,000																				
	N	537	536	537																			
Comm.serv.	Pearson Correl	-,237**	,408**	,498**	1																		
	Sig. (2-tailed)	0,000	0,000	0,000																			
	N	536	536	536	536																		
Tot.Serv.	Pearson Correl	-,271**	,696**	,840**	,814**	1																	
	Sig. (2-tailed)	0,000	0,000	0,000	0,000																		
	N	537	536	537	536	537																	
EE	Pearson Correl	-,446**	,263**	,407**	,441**	,482**	1																
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000																	
	N	525	524	525	524	525	525																
PE	Pearson Correl	-,210**	,195**	,313**	,309**	,355**	,691**	1															
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000																
	N	525	524	525	524	525	525	525															
PEOU	Pearson Correl	-,404**	,279**	,388**	,426**	,472**	,899**	,765**	1														
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000															
	N	523	522	523	522	523	523	523	523														
PU	Pearson Correl	-,256**	,225**	,305**	,318**	,367**	,680**	,726**	,718**	1													
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000														
	N	523	522	523	522	523	523	523	523	523													
BI	Pearson Correl	-,206**	,232**	,335**	,333**	,390**	,609**	,670**	,664**	,651**	1												
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000													
	N	524	523	524	523	524	524	524	523	523	524												
SI	Pearson Correl	0,023	,138**	,217**	,151**	,221**	,276**	,484**	,311**	,514**	,518**	1											
	Sig. (2-tailed)	0,600	0,002	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000												
	N	524	523	524	523	524	524	524	523	523	524	524											
InfoNav.Skill	Pearson Correl	-,434**	,117**	,143**	,177**	,189**	,420**	,117**	,374**	,175**	,127**	-,215**	1										
	Sig. (2-tailed)	0,000	0,008	0,001	0,000	0,000	0,000	0,008	0,000	0,000	0,004	0,000											
	N	518	515	516	515	516	513	513	511	511	512	512	518										
OperationalSkill	Pearson Correl	-,546**	,247**	,352**	,346**	,411**	,687**	,397**	,619**	,419**	,428**	0,067	,448**	1									
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,128	0,000										
	N	519	516	517	516	517	514	514	512	512	513	513	517	519									
SocialSkill	Pearson Correl	-,469**	,236**	,326**	,344**	,393**	,653**	,376**	,593**	,374**	,409**	0,054	,390**	,855**	1								
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,219	0,000	0,000									
	N	518	515	516	515	516	513	513	511	511	512	512	516	518	518								
CreativeSkill	Pearson Correl	-,436**	,185**	,274**	,305**	,333**	,498**	,251**	,414**	,364**	,362**	,113**	,271**	,690**	,618**	1							
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,011	0,000	0,000	0,000								
	N	517	514	515	514	515	512	512	510	510	511	511	516	516	515	517							
Age	Pearson Correl	,393**	-,307**	-,376**	-,294**	-,416**	-,475**	-,262**	-,466**	-,339**	-,289**	-0,079	-,332**	-,524**	-,532**	-,353**	1						
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,072	0,000	0,000	0,000	0,000							
	N	539	535	536	535	536	524	524	522	522	523	523	517	518	517	516	539						
Gender	Pearson Correl	,128**	-0,051	-0,040	-,127**	-,092*	-0,059	-0,030	-0,038	-,120**	-0,075	-0,074	0,021	-,093*	-0,013	-,187**	-0,049	1					
	Sig. (2-tailed)	0,003	0,242	0,360	0,003	0,033	0,178	0,500	0,383	0,006	0,086	0,090	0,632	0,034	0,767	0,000	0,253						
	N	539	535	536	535	536	524	524	522	522	523	523	517	518	517	516	539	539					
Education	Pearson Correl	-,238**	,153**	,157**	,258**	,241**	,366**	,225**	,309**	,184**	,210**	0,027	,319**	,398**	,389**	,315**	-,206**	-0,043	1				
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,532	0,000	0,000	0,000	0,000	0,000	0,316					
	N	534	530	531	530	531	520	520	518	518	519	519	513	514	513	512	533	533	534				
InternetExp.	Pearson Correl	-,276**	,220**	,333**	,386**	,404**	,621**	,458**	,576**	,432**	,414**	,141**	,314**	,620**	,622**	,374**	-,480**	-0,057	,355**	1			
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,183	0,000				
	N	539	535	536	535	536	524	524	522	522	523	523	517	518	517	516	538	538	533	539			
socialEcon.	Pearson Correl	-,335**	,238**	,282**	,246**	,324**	,388**	,189**	,358**	,248**	,249**	0,010	,336**	,475**	,458**	,341**	-,567**	0,016	,335**	,381**	1		
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,825	0,000	0,000	0,000	0,000	0,000	0,715	0,000	0,000			
	N	540	536	537	536	537	525	525	523	523	524	524	518	519	518	517	539	539	534	539	540		
Income	Pearson Correl	-,174**	0,072	,116*	,178**	,158**	,288**	,159**	,265**	,141**	,130**	-0,003	,226**	,326**	,310**	,235**	-0,064	-,099*	,521**	,347**	,351**	1	
	Sig. (2-tailed)	0,000	0,142	0,018	0,000	0,001	0,000	0,001	0,000	0,004	0,008	0,953	0,000	0,000	0,000	0,000	0,189	0,043	0,000	0,000	0,000		
	N	421	417	418	417	418	411	411	410	410	410	410	407	408	407	407	420	420	421	420	421	421	
DigiD_	Pearson Correl	-,264**	,215**	,293**	,380**	,380**	,467**	,365**	,455**	,305**	,353**	,149**	,203**	,451**	,436**	,288**	-,298**	-,136**	,327**	,543**	,287**	,286**	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,002	0,000	0,000	0,000	0,000	
	N	539	535	536	535	536	524	524	522	522	523	523	517	518	517	516	538	538	533	539	539	420	539

7.6 Appendix F: Crosstab support source x education

Support_formal_informal * Opleiding_Laag_Mid_Hoog Crosstabulation

			Opleiding_Laag_Mid_Hoog			
			2,00	3,00	4,00	Total
Support_formal_informal	Social Support	Count	47	57	19	123
		Expected Count	38,3	54,5	30,2	123,0
	Formal Support	Count	1	5	4	10
		Expected Count	3,1	4,4	2,5	10,0
	Social and Formal support	Count	4	12	18	34
		Expected Count	10,6	15,1	8,3	34,0
Total		Count	52	74	41	167
		Expected Count	52,0	74,0	41,0	167,0