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'*Just having a computer doesn't make sense*': The digital divide from the perspective of mothers with a low socio-economic position

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Abstract
The introduction of Information and Communication Technology (ICT) has been shown to play a role in reinforcing existing social inequalities. This study aims to gain insights into the perspectives, experiences and needs of disadvantaged groups with respect to ICT. In the Netherlands, a relatively large and important group of non-users are mothers with a low socio-economic position (SEP). Little attention has been paid to understanding why mothers with a low SEP scarcely use ICTs. In an explorative participatory study in Amsterdam, using observations, interviews and focus groups, our results show that reinforcing factors related to poverty, motherhood, the complexity of ICT and being first-generation immigrant influence access. The mothers' needs are multifaceted and go beyond the simple distribution of ICT devices. ICT education should be tailored and integrated into existing social services and the daily lives of the mothers. Moreover,

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policymakers should pay attention to adapting the online information services to the mothers' strengths.

Keywords
Digital divide, digital inequality, illiteracy, intersectionality, participatory research, poverty, social inequalities, socio-economic position

The digital divide in welfare states

People increasingly depend on Information and Communication Technology (ICT) to search for information and entertainment and to get in touch with health providers, government agencies, schools and social networks. ICT refers to electronic or digital devices, that is, smartphones, laptops, computers or tablets, that facilitate the transfer of information needed to participate in society. Although ICT enables many people to lead more productive and rewarding lives, this is not the case for everyone (Helsper and van Deursen, 2017). The number of ICT non-users, even in advanced welfare states, is still high. In the Netherlands, 17% of citizens lack or have low ICT skills and another 6% have never used the Internet (CBS StatLine, n.d.). Differences in access to, and use of, ICT has resulted in a so-called 'digital divide'. The concept seems to refer to a binary problem, but in real-life the divide is complex, multifaceted and dynamic, and often related to already existing social inequalities (Van Deursen and Helsper, 2015). This study faces the challenges of the digital divide by focusing on the perspectives, experiences and needs of socially disadvantaged citizens with respect to ICT.

Interrelatedness of social and digital inequalities

In the literature, three levels of the digital divide are distinguished. The first level is a simple distinction between those who have material access and those who do not. This level of the divide is decreasing; in the last decade, an increasing proportion of citizens in welfare states gained access to ICT, whether at home, work, school, library or community centre. The second-level digital divide emphasizes that access to technology does not automatically lead to the use of ICT. Research into the second-level digital divide also explains the unequal use of ICT as a consequence of underlying social inequalities (e.g. Helsper and Reisdorf, 2017; Helsper and van Deursen, 2017; Van Deursen and van Dijk, 2015). A person's income, education, literacy level and gender are significantly (directly or indirectly) associated with material access, ICT skills and usage diversity (Morey, 2007; Van Deursen and van Dijk, 2015).

The third level approaches the digital divide more comprehensively by looking not only at the causes but also at the consequences of ICT (Bruno et al., 2010; Helsper, 2012; Schreeder et al., 2017; Van Deursen and Helsper, 2015). It highlights the concern that the introduction of ICT produces 'winners' and 'losers' (Bruno et al., 2010). Research shows that the greater an individual's offline resources, the more ICT leads to beneficial economic, social and educational outcomes (Van Deursen and Helsper, 2015). In other

words, rather than ICT leading to social inclusion, it is the other way around; ICT plays a major role in reinforcing existing social inequalities. This is also confirmed by insights from feminist studies of science, technology and society (STS; e.g. Haraway, 1991; Oudshoorn et al., 2016; Wajcman, 2010).

Feminist STS analyses the mutual shaping relationship between technologies and existing gender inequalities. Offline gender division of household task and childcare responsibilities shape women's Internet use (e.g. Helsper, 2010; Schwanen et al., 2014). Moreover, feminist STS gives insight into the masculine engineering of ICT and how gender is inscribed into ICT and their intended use (Haraway, 1991; Oudshoorn et al., 2016; Wajcman, 2010). Scholars theorizing about intersections add the importance of interrelatedness of socio-demographics such as race, class, age, sexuality and disability in understanding how technologies are constructed, experienced and used (Crenshaw, 1989). Inequalities concerning ICT use are not solely related to singular socio-demographics but should be approached entangled (Crenshaw, 1989; Leurs and Ponzanesi, 2007; Oudshoorn et al., 2016). Therefore, the intersectionality approach highlights the importance of a better understanding of the everyday Internet use in the local context to inform micro-politics concerning social and digital inequalities (Kennedy, 2005; Leurs and Ponzanesi, 2007).

So far, however, most research into the digital divide offers snapshots of how social and digital exclusion are related (e.g. Helsper and Reisdorf, 2017; Helsper and van Deursen, 2017; Van Deursen and van Dijk, 2015). The primarily quantitative research is helpful in mapping the landscape of access and skills, and the way social, economic and digital inequality reinforce each other. However, it is less helpful for understanding the interrelatedness of social and digital inequalities. There is empirical research that explores the issue of digital inclusion from the perspective of the elderly (e.g. Lüders and Brandtzæg, 2017; Quan-Haase et al., 2016). To a lesser extent, literature also reports on the perspectives of immigrants (Alam and Imran, 2015; Guttman et al., 2018; Hallbeg et al., 2016) and low-income communities (Powell, 2010). Those studies are mostly focused on the barriers to ICT use such as affordability (Alam and Imran, 2015; Powell, 2010), language (Alam and Imran, 2015; Guttman et al., 2018), ICT illiteracy (Alam and Imran, 2015), lack of familiarity (Hallbeg et al., 2016), lack of time (Hallbeg et al., 2016) and cultural differences (Guttman et al., 2018). Very little is known about how already disadvantaged groups, in terms of gender, class or race, experience the digitalizing society, and use ICT in daily life, and what they need to participate in our digital society.

This study, therefore, aims to gain insight into the perspectives, experiences and needs of socially disadvantaged groups with respect to ICT to inform micro-politics concerning digital inequalities. This study addresses the issue of the digital divide from the perspectives of mothers with a low socio-economic position (SEP), since this is a large group of non-Internet users in the Netherlands. As shown in Figure 1, women, non-Western immigrants and citizens with a low SEP are more often offline than other groups. SEP is a multidimensional construct referring to income, educational level and position in the job market (Netherlands National Institute for Public Health and the Environment [RIVM], n.d.). In the Netherlands, citizens with a low SEP have more often a non-Western than a Western or Dutch background[1] (CBS StatLine, n.d.). This study focuses specifically on women because of the long-existing offline gender inequalities that affect Internet use

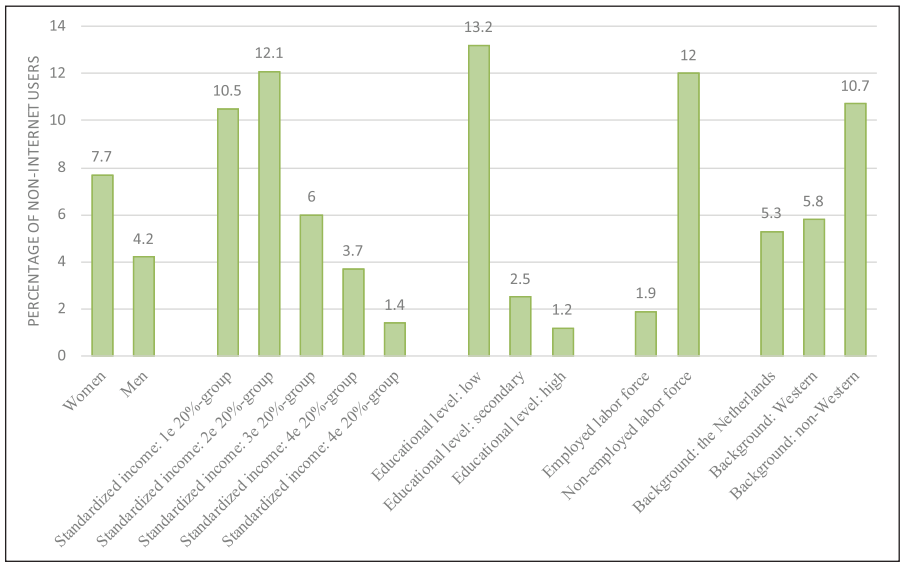

Figure 1. Percentages of non-Internet users in 2018 (CBS Stateline).

(e.g. Helsper, 2010; Schwanen et al., 2014; Wajcman, 2010). Moreover, the focus on mothers is highly relevant because they play an essential role in supporting their children's ICT use; limited or no computer knowledge of parents creates a unique challenge for children in a digitalized society (Tripp, 2010). If mothers can support their children in ICT use, this will have important implications for breaking the cycle of inter-generational poverty (Eynon and Geniets, 2016; Hallbeg et al., 2016).

Analytical framework

Following the intersectional approach, this study avoids generalizing or homogenizing conclusions about gender, SEP and technology (Crenshaw, 1989). This study will, by means of an explorative participatory study, look into the perspectives, experiences and needs of mothers with a low SEP. To study the perspectives, experiences and needs of mothers, we use the well-known multiple access model of Van Dijk (2005), since this model explains the total process of appropriation of ICT, which is a product of several factors such as motivation, material, skills and usage access.

Motivational access. Motivational access is the condition for the other three kinds of access and concerns the appreciation of the technology and intention to purchase and use ICT. Emotional reasons, for example, anxiety about using computers, as well as more rational reasons, for example, malfunctioning of digital technology, can discourage people from purchasing or using ICT (Van Dijk, 2005).

Material access. Having physical access to ICT and the required software is a necessary condition to acquire skills and use ICT. Someone can have physical access at home,

work, school, public places or with family or friends. Material access is related to ongoing economic costs such as payment of the monthly Internet bill and replacement of cheap, second-hand, and frequently broken hardware (Gonzales, 2016).

Skills access. The changing and complex digital world requires continuously new and different skills. Internationally, there is no consensus about the definition of digital skills. However, for full participation in the digital society, it is important to incorporate the full range of skills: from the technical to the more social communication and critical information-navigation skills.

Usage access. Quantitative studies repeatedly show that socio-economic status influences for what purposes ICT is used. For example, poorly educated citizens tend to use ICT more often for games and entertainment, while highly educated citizens more frequently use the computer for capital-enhancing activities like communication, news and information (e.g. Livingstone and Helsper, 2007; Van Deursen and van Dijk, 2013).

Methodology

This explorative participatory study was conducted in Amsterdam – as with over 850,000 citizens it is the most populous city in the Netherlands. The city has a fairly large group of people who risk falling behind in the digital society; 25% have a low level of education, 22.1% live in poverty and 35% have a non-Western background (Onderzoek, Informatie en Statistiek [OIS], 2018). We conducted this research especially in socio-economically deprived areas of Amsterdam: Amsterdam East, North, West and New-West, where those numbers are even higher. This study was conducted in the context of a larger study on the digital divide in Amsterdam in which mothers, fathers, children, and volunteers and professionals who work closely with families with a low SEP were involved.

Formal and informal gatekeepers of language schools and community centres assisted in reaching potential participants. In total, we involved 66 socio-economically disadvantaged mothers living in New-West ($n=31$), Amsterdam West ($n=19$), East ($n=11$), and North ($n=5$). The participants were between 20 and 60 years old. Nearly all mothers were married and the number of children varied between one and seven. The age of the children ranged from neonate to 20 years. Most mothers were unemployed and a few were volunteering in a community centre. Most mothers had a non-Western background (92%), of whom 27% were from Morocco and 13% from Turkey. The non-Western mothers were mostly first-generation immigrants, and they often had poor Dutch language and ICT skills. Only 8% had a Dutch background. While we know that mothers with a Dutch background probably experience different barriers in ICT use (Alam and Imran, 2015; Guttman et al., 2018), we did not exclude these women since this study focused on mothers with a low SEP.

Study design

This explorative participatory study, based on qualitative data gathered through participant observations (POs), semi-structured interviews (SSIs) and focus group discussions

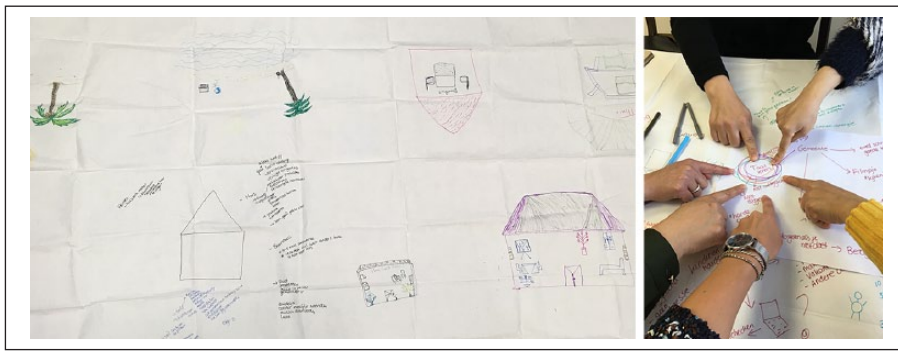

Figure 2. Examples of the use of a tablecloth during the POs and FGDs.

(FGDs), reports on the perspectives of mothers with a low SEP. A participatory approach was chosen because by fostering dialogue between stakeholders and explicitly including the voices of those who are often underrepresented or have less power or possibilities to make themselves heard, this approach enlarges the social relevance (Abma et al., 2017). Data collection took place from April to October 2017 and comprised two phases.

In the first phase, seven language courses and two digital skills courses were observed ($n = 38$, duration 1–3 hours), and seven SSIs were conducted (duration 20–70 minutes). The aim of the POs was to gain more insight into the complex daily reality of mothers and how mothers act in our digitalized society. The observed meetings were not especially initiated for this study and therefore the researchers were sympathetic to the main goal of the activity or event while gathering information about the mothers' lives, as well as their views on today's digital society. However, in all cases, the topic of the digital society was discussed for at least 30 minutes. The observations list of the researchers was based on the four types of access as described by Van Dijk (2005). In all cases, extensive field notes were written immediately afterwards. Also, the observations were written or drawn on a tablecloth together with the mothers (Figure 2). This creative method was introduced after PO6 because we observed and obtained feedback that a verbal discussion does not result in deep insights due to language barriers and trust issues. The introduced method is more inclusive to people with low levels of literacy. The visualizations reduce the language barrier and making a shared product creates an avenue for the researcher to build trust and to show an understanding of what is considered important to the mothers. Moreover, using drawings and easy words on a tablecloth increases the reflectivity of the mothers and increases validity since the researcher can check whether the mothers have been well understood. The aim of the SSIs was to gain a deeper understanding of the needs of the mothers in our digitalized society. To ensure validity, the questions of the SSIs were concentrated on the four kinds of access described by Van Dijk (2005) as well as the research objective (Table 1). When consent was obtained, interviews were audio-taped and transcribed verbatim. Four out of seven interviews were audio-recorded. During the other three interviews, for which no consent was obtained, extensive fields notes were written. Low language level was the main reason for mothers to not give consent for recording.

Table 1. Interview prompts.

Research topics	Example question(s)
Motivation	What is your main motivation to use (or not use) ICT?
Material access	Where do you use ICT most often? Do you have home access to a computer/laptop/tablet?
Skills	Do you experience difficulties using a computer/mobile phone/tablet? If so, what are these difficulties?
Usage	How often do you use ICT? For what purpose do you use ICT? Do you use ICT for communication/find information about your health, find information on governmental websites, etc.
Barriers	Which barriers hamper you in ICT use?
Needs	What or who can help you to use the computer more often?

ICT: Information and Communication Technology.

Table 2. FGDs activities and prompts.

Research topic	Activity	Example question(s)
Where do you want to learn more about ICT?	Drawing ideal 'learn locations' on a tablecloth and group discussion	What do you need to learn more about ICT? Why do you prefer to learn alone or with peers?
Where can your child learn more about ICT?	Group discussion using A3 poster with pictures covering three topics: teachers, place/location and activities.	What is the most ideal place for your child to learn more about ICT? Which activities is your child allowed to do during a ICT class?
Can vlogs help you to learn more about ICT?	Vlog making in or around the community centre. In three out of four FGDs, a short video was made. Topic of the vlog was chosen by the mothers.	How can vlogs help you to learn more about ICT?

FGD: focus group discussions; ICT: Information and Communication Technology.

In the second phase, four FGDs ($n = 21$, duration 1–3 hours) were organized. The main aim was to gain insight into the ideas and advices of mothers with a low SEP to increase meaningful ICT use. In order to work in co-creation towards opportunities that can increase ICT use, three topics were discussed (Table 2). To empower all mothers, with varying Dutch language skills in a verbal discussion, the activities include pictures and visualizations. The moderator made sure that each mother had the opportunity to share her opinion and, if needed, clarified what was said. The topics were determined on the basis of the data analysis from the first phase, POs and SSIs, and complemented with insights from professionals (e.g. debt counsellors, and language, ICT and high school teachers) and volunteers (e.g. language and ICT teachers and community service workers) who are closely working with citizens with a low SEP. During the FGDs, field notes were written on the tablecloth, an A3 poster, and in the researchers' notebook. Immediately

after the sessions, the field notes were complemented, clarified and summarized in one document.

Data analysis

Full transcripts and field notes were analysed through ethnographic content analysis using the software programme Atlas.ti. One researcher (N.G.) coded the data. From the start in weekly meetings with the project team, comprising the authors (N.G., R.K. and C.D.) and three policymakers of the City of Amsterdam, interim findings and coding were discussed. These discussions were used as input in the next data-collection sessions to deepen or validate the findings. With respect to the digital divide, we distinguish four themes based on the multiple access model of Van Dijk (2005): motivational, material, skills and usage access. Moreover, one additional theme was included: needs and ideas. In the final stage of this research, the project team agreed upon the coding scheme and findings. Data collection and analysis was done in Dutch. To prevent loss of meaning, the codes and quotes were translated into English only in the final phase of preparing this article.

Ethics

This study adhered to the Code of Ethics for the Social and Behavioural Sciences involving human participants as accepted by the deans of Social Sciences in the Netherlands, January 2016. The study did not need formal approval of a Medical Ethical Committee according to the Dutch Act on Medical Research Involving Human Participants (Wet medisch-wetenschappelijk onderzoek met mensen [WMO]). The study aimed to respect the privacy, human dignity and fair distribution of benefits and burden. Mothers were informed beforehand about the goal of the study, the voluntary basis of participation and that they could withdraw at any moment without reason. To develop a relationship of trust and establish high levels of rapport, the researchers took time to get to know the mothers. To guarantee privacy and anonymity, participants' names were coded and fictitious names are used in this article.

Findings: the experiences and needs of mothers with a low SEP

In this section, we portray the experiences of mothers with a low SEP in our digitalized society. We describe our findings in terms of the four types of access: motivational, material, skills and usage access. Furthermore, we portray the mothers' needs and ideas in order to develop appropriate policies and interventions.

Motivational access

A strong motivation for mothers to have access to ICT is related to their children. Mothers are convinced that ICT can help their children in school and increase the chance of a better life: My children definitely need a computer for their homework. For me, it is annoying to continuously ask the neighbor if my children can use her computer. (Nuran, FGD3). Mei-lan (PO1) mentions that her daughter learned Chinese by playing games on her phone. She proudly highlights 'She doesn't even have an accent […] I have one'. In

addition, most mothers highlight that ICT is important for their children to be socially included. As Nilofar, mother of twins, clarifies,

> I want a computer for my children. They get to know all kind of websites on school and TV. I want my children to be happy. (Nilofar, PO1)

One belief shared by almost all mothers is that children below the age of five should not have access to ICT, explaining that it is 'Bad for their eyes' and 'Bad for their brains'.

Some mothers also explain that their children motivate them to learn more about the computer themselves. Some mothers feel anxious that their children are having to use a technology which they themselves do not master. Alicia (FGD4) explains that she has no idea what her daughter is doing behind the computer for school. The digital society also makes it hard for mothers to stay involved in their children's learning process. Esila, mother of two children, explains that her niece was working for a half hour on her laptop for a school project but in the end only wrote one small paragraph. Esila is worried about what her niece was really doing at the computer and what she saw on the Internet. Many mothers add that they do not trust the online world. In other words, some mothers want to learn more about ICT in order not only to be able to help their children, especially with homework, but also to be able to gain insight into, and have control over, what their children are doing online.

In contrast, some mothers are not motivated to learn more about the computer. They ask their children (if over 12 years of age) or other family members to help them out. For example, Rashida (PO4), who has seven children, explains, 'My son can find out how much is in my bank account'. She clarifies, 'I am busy with the children. […] and I don't want all those things in my head'. Other mothers explain that taking care of their children, managing their household and making ends meet every week is more important than learning how to work with a computer. This indicates that for mothers, it is important to have time and energy to learn more about using a computer. For example, Lybosa (PO7), who has been in the Netherlands for 37 years, started only 6 months ago with her ICT and language course. The main reason for her to start the course is that her children have moved out. She finally has time now.

Material access

Most mothers explain that they often have access to at least one ICT device: a smartphone, computer, laptop or tablet. In households with older (>12 years) children, a programme of the City of Amsterdam[2] ensures that there is at least one device in the family:

> I don't have a computer at home. […] I can't afford it. Too expensive. But luckily my son gets a laptop from the City of Amsterdam. That is so lovely. […] It is important for my son but also for myself. (Doria, SSI3)

Nevertheless, it is not self-evident that each household in Amsterdam has a proper working device and that all preconditions (wi-fi, hard- and software and printer) are available to use ICT effectively. For example, Nyah (PO2) explains that she does not have wi-fi in her new house. She mentions more than three times: 'Someone needs to come to connect the Internet'. Jantien (SSI7) adds that her children often need to print documents for

school, but she doesn't have a printer at home. She needs to go to the public library. For each page, also for the wrong ones, she needs to pay €0.10. The cost sometimes rises to €2.20. Jantien stresses that she could have bought a loaf of bread for that money.

Most mothers highlight the importance of having material access at home:

> My computer is broken, I need to do everything with my phone. But there are things I can't do with my phone: taxes and insurances. (Lauren, FGD3)

Deema (FGD3) also has no home computer. During a 'back to work course', she explains that she had to send her curriculum vitae to a company that morning. She needed to adjust something, but she couldn't do that on her phone. With stress in her voice, she states, 'I missed the deadline of the job application'.

There are several public places were mothers can have access to a computer and Internet, such as public libraries, Internet cafés or community centres. For the mothers without a computer at home, using a public computer is not the perfect solution. Some mothers explain that those public places lack privacy, they feel 'unsafe'. Deema (FGD3) points out that she is afraid of unsolicited viewers and that her passwords will be saved on the computer. Furthermore, she is easily distracted by all of the noises around her. Moreover, no support is available and the timeslots cause many mothers a lot of stress.

Skills access

Based on the SSIs, POs and FGDs, we cannot give a detailed description of the mothers' ICT skills. However, most important is that illiteracy restricts many mothers' ICT use. To the question, what makes it hard to use a computer, Ghina (SSI1) answered, 'First language, second no knowledge about how to use the computer'. A lot of mothers agree with Ghina. They explain that if you speak the language most websites will not be that complicated. But if you do not know what is on your screen, you will definitely get lost.

Furthermore, it stands out that most mothers show fragmented ICT abilities or so-called 'splinter skills'. For example, during one of the language lessons in a primary school, mothers practise the Dutch language on a laptop. Katinka (PO4), a mother from Kosovo with three children, seems quite skilled on her phone and on the laptop. She explains a lot to her neighbour. However, at some point, she accidentally pressed the Caps Lock button. After a while, she needs to re-enter her password. She is stressed about why all the letters are in capitals and she has no idea how to fix this problem. Also, Doria (SSI3) experiences difficulties and frustrations because of her 'splinter skills'. She explains,

> I have an email address. […] I use it for example if my doctor asks me to give my e-mail address. […] If someone sends me an email I can react to that, but I can't make a new one. (Doria, SSI3)

Finally, some mothers explicitly mention that it is easier to use a smartphone than a computer. According to Esila, her smartphone is a small computer. Also, Céline (SSI6) explains, 'I use my smartphone actually for everything'. However, the previously described example of Deema and Lauren's quote highlight that mothers cannot do everything on their phones. Most mothers highlight that a smartphone or tablet is more for the 'fun things', while you need a computer to arrange more official matters.

Usage access

YouTube is the Internet site mothers most often mention and is generally used to find information, such as about cooking, health and household chores (e.g. 'how to remove this spot on my clothes' or 'how to attach this button to my clothes'), beauty, job interviews and other cultures. Also, Google is used to find information about such topics:

> I will search all information on the Internet. If I have pain in my stomach or if something happens to my children. I will search that on the Internet. What do I need to do? I always ask Google. (Ghina, SSI2)

The advantage of Google and YouTube over official websites is that mothers' can look for information in their own language. During PO4, Kadija and Zainab explain,

Kadija:	Yes, he [her husband] is doing everything with income, the bank, the money […] I don't understand, my husband does.
Researcher:	What makes it difficult?
Zaineb:	Maybe the language? Yes, the language?
Kadija:	Language yes.[…]
Kadija:	Sometimes when I need to cook I search in Pakistani.
Zaineb:	Ooh. Yes.
Kadija:	Actually, I always search in Pakistani. I can read. Also for my children I search [about how to take care of her children].

Other applications often mentioned are WhatsApp and Skype, which are used to keep in touch with their families back home and friends. Furthermore, mothers use the computer together with their children to practise for school or to find information. Magister, an online programme used in secondary schools to communicate with students and their parents about grades and presence, is most often mentioned:

> Just the Internet, practising for school with my son. They call it Kinzy, Taal Begrip, and Ballon [online programmes used in primary schools]. He has to practise every day. And I also check the Magister page of my daughter every day. (Zairah, PO6)

> Sometimes I take a look at the homework of my oldest two children. I have two children in secondary school. I always check their schedule, what they need to do that day and if they are in time. […] Yes, if they are in time in school, I want to check everything, homework, always checking. (Olivia, PO6)

Mothers do not spontaneously mention that they use a computer to find information on the websites of government agencies, tax authorities, (health) insurance or other agencies. Some mothers lack knowledge of the online possibilities. For example, Nyah has no idea what a 'Digi-D code' (personal online code to communicate with the Dutch government, municipalities, health insurance, hospital and several other authorities) is. Several other mothers mention that they do not have a 'Digi-D code'. The mothers who are familiar with the official websites say that these are too complicated, mostly because of the language level used.

Another major issue in using the Internet, especially official websites, is that of confidence and trust. Almost all mothers mention that they do not trust the official websites. Mei-lan (FGD2), for example, explains that she needed to apply online for a public transport card for her youngest son of six. It failed mostly because she was afraid that she did not fill in her personal details correctly, afraid to pay for something that will not be delivered because of a small mistake. Furthermore, Jantien mentions,

> Those websites [of the City of Amsterdam and the Dutch government], if I click somewhere my screen changes. I don't know how to get it back. (Jantien, SSI7)

She is afraid that if she clicks on wrong buttons it may have major consequences.

Needs and ideas

Asking about the mothers' needs and advice to increase accessibility to ICT, their primary reaction is that they have needs for their children. A printer and homework assistance are often mentioned. For example, Doria (SSI3), a single mother, explains that her son needs a printer for school:

Researcher:	You told me you like to have a printer?
Doria:	Yes, I really want one.
Researcher:	Why do you need one?
Doria:	If my son goes to secondary school. He needs to print a lot, but he can't. Maybe he can go to the library […] but [the road to the] library is not always safe for my son. […] and the library is not in the neighborhood.

Doria also explains that she really needs homework assistance for her son. It is frustrating for her because her own limited knowledge of Dutch means she cannot help her son with his homework. She can also not afford someone who can help him:

> For parents who live on social welfare and can't work like me. And, yes, then you can't afford a tutor. I heard that you need to pay 10, 20 or 8 euro for one hour. For me, that is too expensive. (Doria, SSI3)

Asking more about the mothers' own needs to increase meaningful ICT use, most say that they first want to improve their Dutch. Many mothers indicate facing more barriers because of their lack of language skills than their lack of ICT skills. For example, in the language course in the community centre 'complicated letters' is a recurrent theme. Larissa (PO2), a mother originally from Russia and living in the Netherlands for 6 years, brings a letter from her doctor to the language class. A letter with a lot of jargon and no pictures. Mothers indicate that such letters, but also websites, need to be tuned to their needs. Bouchra (PO5), a mother of three children, highlights that if websites contained less jargon, she would not need help with the computer. Ghina (SSI1) adds, 'For example for the website of the City of Amsterdam you really need language. […] Everyone needs language'. Furthermore, a few mothers say that they would prefer that official websites could also be accessed with a smartphone, since several do not have access to a proper working computer or laptop with Internet access.

In addition, almost all mothers need someone who can help them with the computer. The mothers explain that the digital world has no face. A computer is not someone who you can trust and ask questions about personal and confidential information, such as an online bank account. Lyobosa (PO4) points out that 'just having a computer doesn't make sense'. She likes to go to the computer walk-in hour at her language school because there are volunteers whom she trusts and help her both with Dutch and the computer. Lybosa indicates that she never goes to the public library because there is no one who can help her. Almost all mothers agree with her. For Furat (FGD2), 'The public library is a place for someone who knows how to work with the computer'.

A few mothers prefer to improve their computer skills at home but most highlight a need for a place where they can learn more about computers. At home, mothers have no time for themselves, because the household and their children are more important. Eslem (FGD1) says that, at home, she needs to attend to her crying baby. Now, she hardly has time to cook, never mind to learn. For the mothers, it is important to have a place where they feel safe and receive personal attention from a teacher they trust. More than half of the mothers mention community centres as an ideal place, while others mention language schools and primary schools. Community centres, language and primary schools are seen as inviting places where they can ask questions, complement each other, laugh together and share good practices or tips. Furthermore, the mothers trust the volunteers and/or professionals. During a language course in a community centre, Nilofar (PO1) explains, 'Clara [volunteer] is also my doctor', the other mother nods enthusiastically. The mothers completely trust Clara and feel free to ask all kind of questions.

Mothers attending the community centres and language schools are all very grateful for the help of the volunteers. However, observations show that the digital skills of some of the volunteers are quite low. The following fragment of the first author logbook highlights this:

> Larissa (PO2) brought a letter to class in which was explained that she needed to come to the hospital for a check. She has no idea how to find her way to the hospital. Nyah (PO2) explains that you can find that on Google. She explains that you need to search for the address and then push the button 'route'. Since the community center has no computers, tablets, and/or Wi-Fi, the volunteer use her own smartphone to search for the route. I [the researcher] needed to help the volunteer and we only showed the results to Larissa. Larissa was helped, but no one learned something.

Practical conditions for places where mothers would like to improve their ICT skills are closely related to the context of poverty. First, the location should be close to their homes. Some mothers do not have the budget and time to travel out of their own neighbourhoods. Furat (FGD2) explains, 'East is quite far away. I lost time and money on the way'. Second, the timing is important. The lessons need to be during school hours, because mothers do not have the money to pay for daycare. Ghina (SSI1) explains, '[…] At school. A safe place. […] It is between 9 till 11. The children are at school, all mothers have time'. Third, it should be a place without daily distractions, for example, children, household chores and buying groceries. Fourth, there is a need for a place for pre-school children. Observations of language classes show that mothers bring their small children because they don't have the money to pay for a babysitter. Finally, mothers like to get personal attention and learn things they need to know at that time. Mothers indicate that

the 'walk-in hour format' is more suitable than classical lessons. Deema (FGD3) explains, 'then [in case of classical lessons] I come for nothing, I don't want to learn things I already know'.

Discussion

This study highlights the complexity of accomplishing digital inclusion for mothers with a low SEP. We followed an intersectionality approach (Crenshaw, 1989) and used the multiple access model of Van Dijk (2005) while analysing the mothers' experiences and needs in our digitalizing society to inform policy. While this study was only focused on the inclusion of mothers with a low SEP, a high percentage of the included mothers had a non-Western background, which is only partly explained through the high percentage of citizens with a non-Western background in the researched neighbourhoods, that is, Amsterdam New-West (52%), East (32%), West (31%), and Amsterdam North (38%) (OIS, 2018).

This suggests that some socio-demographics deserve special attention when studying the digital divide. The intersectionality approach is particularly well-suited to highlight the interrelatedness of a wide range of socio-demographic characteristics such as race, class, age, sexuality and disability, which can influence how technologies are experienced and used (Crenshaw, 1989). This study shows that it is indeed relevant to attend to such intersecting socio-demographics, but that it may be worth specifying in more detail how these play out differently in different settings. In our case, although this study was focused on mothers with a low SEP irrespective of migration background, we ended up including 92% non-Western immigrants. This study therefore highlights that motherhood, poverty, low literacy and education and experiences of the digitalizing society were strongly influenced by being a non-Western immigrant with Dutch as a second language (generally first-generation). Being more specific about this *type* of intersectionality shows that policy should not focus on the digital divide in general but should adapt to the drivers of the digital divide in a particular area. In Amsterdam, given the strong influence of language on digital inclusion, policy could, for example, be more successful when integrating language training, poverty alleviation and ICT skills.

Such sensitivity to specific intersections of socio-demographics also indicate that it can be deceptive to think that the first-level digital divide, material access, is no longer a substantive issue in a country like the Netherlands. Although Internet coverage approached 96% (CBS StatLine, n.d.), this obscures the *real* material access to ICT for certain groups. Most mothers have home access to at least one ICT device, but often lack the basic conditions, for example, good working devices, appropriate software, Wi-Fi or a printer. This is in line with the theoretical lens of technology maintenance that suggests that material access is, for all users, more than the ability to purchase a device (Gonzales, 2016; Jackson, 2014). Marginalized groups more frequently experience malfunction and disconnection because they need to work with second-hand and cheap devices (Gonzales, 2016).

Our findings also show that motivation to use and learn more about ICT entails more than the notion of Van Dijk (2005: 27) that motivation is shaped by a person's attitudes towards technology. Mothers' motivation is first and foremost influenced by the wish to

provide a better life for their children. Many mothers were eager to learn more about ICT because they want to help, and/or check on, their children. However, our findings highlight that with developing ICT courses, policymakers should keep in mind that the complex daily reality of poverty and family life strongly influence mothers' priorities and cognitive resources. For some mothers, the struggle to get by, managing sporadic income, making difficult trade-offs and/or dealing with poor language skills is more important than learning ICT skills. In addition, the cognitive system has limited capacity and being poor means coping with a deficit of cognitive resources (Mani et al., 2013). Financial concerns or the struggle with poor language abilities leave fewer cognitive resources available to learn new things, like ICT skills.

Moreover, the social environment affects the quality of support for learning new ICT skills (Courtois and Verdegem, 2014; Helsper and van Deursen, 2017). Our findings suggest that mothers who seek support in their ICT use often get informal support from their children and volunteers. While all mothers indicate that they are very grateful for the help of volunteers, observations show that the digital skills of some of the volunteers are quite low. Also, the literature illustrates that informal support from children, other family members and friends might be readily available and can solve the problem but is often not good enough to increase the mothers' ICT skills. Those with the lowest ICT skills seems to have the most difficulty in obtaining high-quality formal support and are therefore often dependent on informal support of poor quality (Courtois and Verdegem, 2014; Helsper and van Deursen, 2017).

In line, mothers indicate the great need for a place where they can improve their ICT skills. ICT education should be of a sufficient level and match their practical and personal needs in terms of the complex daily reality in which they live. Interventions need to be efficient in the sense of time, motivation and energy since people have other important issues to tackle. Mothers' highlight the need for integration of ICT education in the places where they already go, for example, primary schools, language classes or debt-assistance classes. It is not new that today's digitalizing society demands that the specialized social services should continuously adapt to the changing users' needs and changing society. However, practice shows that there is still a lack of integrated social services. Most social service organizations are specialized and focus on one area, for example, language, debts, ICT skills and others. Funds of the Dutch government or the City of Amsterdam are often solely intended for language, poverty or ICT skills, which makes it hard for social services to integrate.

Interestingly, most mothers indicate to use ICT, to a greater or lesser extent, to find information on YouTube or Google, or to communicate with friends and family via Skype or WhatsApp. Those programmes are visual and high-level Dutch linguistic abilities are not a primary condition for using those programmes. Our findings suggest that low literacy impacts the likelihood of understanding the more official websites, for example, websites of governmental agencies and programmes, that are not attuned to the mothers' needs. For responsible web-based information service, for example, health, government or legal information, the websites should be attuned to the capabilities and strengths of the most vulnerable groups. Feminist studies of STS highlight that often the social and cultural factors of the majority affect the design and use of ICTs (Haraway, 1991; Wajcman, 2010). Mothers with a low SEP are often neglected in the design processes. Without the deliberate inclusion of vulnerable groups, there is explicit exclusion

(Wajcman, 2010). The results of this research highlight the need for future research in order to develop a system that guarantees the inclusiveness of mothers with a low SEP in the design of ICT and policies concerning the implementation of ICT.

Limitations and future work

This study provides new insights into barriers that hamper mothers in making meaningful ICT use and their needs and ideas, though some limitations warrant consideration. First, the main language in the observed formal and informal events and interviews was Dutch. Since Dutch is a second language for most participants, this sometimes made it difficult for the mothers to understand the questions and respond fluently. To eliminate the language barrier as much as possible, language teachers and other participants helped with clarifying the questions and answers. Moreover, by using a tablecloth during the POs and FGDs, we adapted our method to the capabilities and strengths of the mothers, which resulted in a deeper understanding of the mothers' experiences and needs. However, we cannot be sure that this allowed us to fully capture their contributions. Second, most participants had a non-Western background and raised a number of language-related issues. The small number (8%) of mothers with a Dutch background did not mention any other barriers, probably because almost all of these are related to motherhood and the context of poverty. However, since language difficulties are considered one of the main barriers to using ICT in this study, and other studies report on the effect of cultural difference on Internet use (e.g. Guttman et al., 2018), we recommend that future studies focus more on cultural differences concerning Internet use. Finally, the conclusions are based on the experiences of mothers living in a particular time and place. The findings are open for consideration in other contexts and time periods, in particular since time is likely to have an impact on the findings because ICT possibilities are rapidly changing.

Conclusion

The perspectives, experiences and needs of mothers with a low SEP in respect to ICT were mainly influenced by motherhood, poverty and the complexity of ICT, all of which were amplified through being first-generation, non-Western immigrants. These mothers' needs are multifaceted and go beyond simple distribution of ICT devices. ICT education should be tailored and integrated into other social services and the daily lives of the mothers involved, which in this case means the need to integrate ICT training with poverty alleviation and language skills. Though such needs will differ according to the setting and socio-demographics encountered, ICT education at all times should be efficient in the sense of time, motivation and energy required by all involved. Moreover, there is a clear need for changes in the supply of the ICT. Policymakers need to pay attention to adapting the web-based information services to the mothers' needs and strengths, much like we as researchers needed to adapt our methods of the POs and FGDs to make them more transparent and visual. Just as we would have found it nearly impossible to make the mothers fit our methods, it also seems more promising to change websites to match the capabilities and strengths of the most vulnerable than to merely try and teach them how to use ICT in a world that has not been designed for them.

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Notes

1. Citizens with Western or Non-Western background have at least one parent who was born outside the Netherlands. A Western background refers to Europe (excluding Turkey), North-America, Oceania, Indonesia or Japan. Non-Western background refers to Asia (excluding Indonesia and Japan), Latin-America, Africa and Turkey. This division is based on the social-economic differences. Indonesia is seen as a Western country because of the high percentage of originally Dutch re-immigrants (CBS StatLine, n.d.).
2. The City of Amsterdam provides laptops to children of secondary education and MBO (vocational education) of which the parents have a low income. Once in 4 years parents with children between 10 and 18 years old can receive a laptop or tablet for their child and can request a reimbursement for the Internet costs (Gemeente Amsterdam, 2017).

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