

Reduce the Digital Divide in the Netherlands: A Smartphone-based Method to support Low Literate People

Wouter de Boer, S2652245

Vrije Universiteit, Amsterdam

w7.de.boer@student.vu.nl



ABSTRACT

This research, which aims to reduce the Digital Divide in the Netherlands, is conducted to find out if ICT solutions can be of help to low literate people, especially people with a migration background with Dutch as their second language, to access and understand written information. Despite the difficulty in reaching the target groups, an iterative, adaptive and collaborative method, in close co-operation with representatives from the target group has been used, based on three principles (i) goals and objectives are set by local users, (ii) co-creation is done in partnerships, (iii) the technologies are fully adapted to the local context. In this paper we evaluate how a number of existing tools can be adapted into a smartphone app and put into practice, based on these principles. Three cycles of user evaluations show that the target group can be well supported with ICT solutions in bridging their low literacy problems if they are

closely involved in the design, adaptation and evaluation of digital solutions.

KEYWORDS

W4RA, low literacy, digital divide, digital inclusion, ICT4D, OCR, Google Translate, NT1, NT2

1 INTRODUCTION

W4RA is an interdisciplinary network collaboration of scientists and professionals in information and computer sciences, informatics, software development, organization, business, and communication. The mission of W4RA is to support people who live in poverty or in rural environments. The aim is to enhance information, communication and knowledge sharing by developing innovative ICT applications and solutions. Within W4RA there is a strong belief that the key stakeholders have to be put central place. One of the projects of the W4RA program on the Vrije Universiteit Amsterdam is the Digital Divide in the Netherlands. The research described in this paper is a sub-project of the Digital Divide. Together with three other master students, action research has been executed to bridge the digital gap in Amsterdam. Within each sub-project, specific targets group to be supported have been selected. By using the ICT4D 3.0 framework each sub-project is aiming to find user-centered solutions that contribute to bridging the digital gap in the Netherlands. This research describes one of the sub-projects in which the focus is set to help migrants in comprehending letters. In the conclusion, we will return briefly to the other sub-projects and give a short evaluation about the general Digital Divide project.

1.1 Digital divide

Our society is digitizing fast, and at the moment, it is a hard challenge for the government and the municipalities to ensure that all citizens connect and benefit from the digital transformations. The digitization of national services has many advantages. Money can be saved, and services can be executed faster, for example. On the other hand, digitization also has its problems. The digitization of services and information results in a divide between people who understand the digitized world and people who have difficulty in this world. This dichotomy is classified as a digital divide. In previous research, the digital divide is defined as the social and economic differences in the access to and the usage of information and communication technology (ICT) [9].

When computers and mobile phones were in the initial phase of becoming mainstream, the digital divide was mostly caused by having access to ICT devices and by not having access to the devices. In this period, low-income families could not afford expensive mobile phones and computers [7]. Due to the rise of mobile phones and computers, more and more families could afford these devices. The inequality shifted from, having access or not having access, to having or not having the skills to use the digital equipment. Low literate people started to lag behind the rest when it comes to digitization.

1.2 Goal of the research

In this research, we focus on the digital divide in the Netherlands, although the same principles and results may apply in equivalent regions. In this action research, information technology and digital equipment are used to involve people in today's society. The main goal of this research is to help people who have difficulty in connecting to the society. With this project, we try to reduce the digital divide in the Netherlands. By listening to the needs of the people, we try to ensure that individuals and communities, including the

most disadvantaged, have access to and can make use of ICT so that they get involved in the society.

1.3 Numbers

On 16 June 2018, the Dutch government announced that its objective was to be the digital leader in Europe¹. The mission is ambitious but at the same time remarkable when we look at numbers of the general audit office (de Algemene Rekenkamer). They state that about 2.5 million people in the Netherlands have difficulty working with digital devices such as a smartphone, tablet, or computer [14]. The CBS (Centraal Bureau voor de Statistiek) even reports that in 2016 about 1.2 million people in the Netherlands never used the Internet [16]. These numbers and other news items are worrying when we realize that more and more government services are digitized. On 16 June 2017, De Volkskrant writes in a news item that low literate people are the first people who suffer when the society is getting more complex². Low literate people will get lost in their way online and cannot get the required information out of the letters they receive. According to the SCP (Sociaal en Cultureel Planbureau), a large group of digital illiterate people is lagging behind the rest of the Dutch people [2].

1.4 Consequences of low literacy

Not being able to read and write has significant disadvantages³, for example:

Unemployment Half of the people who have difficulty reading and writing are unemployed. They often find it challenging to write an application letter. The challenge makes it difficult for them to find a job. They also have difficulty retaining their job, especially when the work becomes more complicated.

Health issues People who cannot read and write well often have problems with their health. For example, they cannot correctly read the package leaflets for medicines. As a result, there is a good chance that they will misuse medicines.

Children with language deficiency Parents who have difficulty with language cannot correctly read to their children. They are not able to help their children with homework. As a result, there is a good chance that their children will not learn to read and write correctly.

Communications problems Filling digital forms to apply for a benefit, allowances, and taxes can be challenging. It is also often difficult to use a computer, tablet, and telephone.

It is essential to ensure that people who have less digital and linguistic skills stay connected with society and that we decrease the digital divide. Therefore it is good to see that the government states in the same news item of 16 June 2018 that is important that public services and new technologies are accessible to everyone. The transparency and accessibility of the digital government are important objectives, see Figure 14 for a complete overview of the government's digital objectives.

¹www.rijksoverheid.nl

²www.volkskrant.nl

³<https://www.rijksoverheid.nl/onderwerpen/taal-rekenen-digitalevaardigheden/aanpak-laaggeletterdheid>

1.5 Building blocks for digital inclusion

The task to make the digital environment accessible for everyone is a job for which the municipalities have been made responsible. In the [Coalition Agreement of 2018](#), the municipality of Amsterdam agreed that they would keep attention on people who have difficulty with the digitization [1], see Figure 15. In practice, it has been found that many people who live in poverty in Amsterdam have limited digital ability and that they are unable to cope sufficiently in today's society. This observation prompted the poverty director⁴ of Amsterdam to investigate this theme further. The results of the research are included in the [Bouwstenen voor Digitale Inclusie](#) report. The report makes recommendations on how to close the digital gap. In one of the recommendations, the writers advise the municipality to invest in a good interaction with citizens that have low digital skills and to use the smartphone for this interaction, see Figure 17. In research conducted by Deloitte in 2018, it emerged that at least 93% of the Dutch people are in possession of a smartphone⁵. Therefore, we focus in this research on this recommendation and investigate how the smartphone can be used to include people digitally.

1.6 Target group

In the report, a bright group experiencing problems with digitization is mentioned. The focus is mainly on 21% of the people in Amsterdam that live in poverty, including children, adults, and elderly. The target group can be divided into four subgroups:

- Migrants
- Disabled people
- People with a difficult social background
- Low literate people

The group of low literate people can be divided into two groups: people who have Dutch as their native language (NT1), and people who have Dutch as their second language (NT2). In the Netherlands approximately 65% of the low literate people is NT1 [6]. The initial focus in this study was on the NT1 group, but due to circumstances, I was forced to shift to the NT2 group. The reason for this is explained in more detail later in the report.

1.7 Costs of low literacy in the Netherlands

Research by PricewaterhouseCoopers (PwC) shows that the total social costs for low literacy are about €1.13 billion per year⁶. The research shows that low literate people miss out on €572 million income each year, see Figure 16 for a more detailed description of the annual costs. The inability to read, write and/or calculate correctly directly affects people's prosperity. This results in less income from work and higher healthcare costs for low literate people. Both for the prosperity of the low literate and the finances of the government, it is therefore essential that this problem is tackled.

2 RESEARCH QUESTIONS

In this research, we will verify the third recommendation of the [Bouwstenen voor Digitale Inclusie](#) report. We investigate if the

smartphone can be used to strengthen the interaction between the municipality and citizens, and we investigate how the smartphone can be used in practice for this purpose. The municipality and other social organizations most often communicate through written letters. It is problematic that the information is not understood by people who cannot read. We investigate whether the smartphone can contribute to understanding letters. We do this by answering the main research question:

- How can a mobile application support low literate people in understanding letters?

To answer the main research question, the following sub-questions are answered:

- Can we verify the third recommendation made in the [Bouwstenen voor Digitale Inclusie](#) report?
- Do low literate people currently have problems in understanding letters? And what are they currently doing in this situation?
- What could be improved on the current letters and what is being done?
- Are low literate people open for advice about the use of their smartphone for this purposes?
- What functionality is required to achieve our goal?
- Are there usable mobile applications or do we have to develop a new application ourselves based on the needs of the low literate people?
- How do we ensure that the methodology to understand letters is used in practice?
- How do we ensure a sustainable approach and completion of the project?
- Is the [ICT4D 3.0](#) framework a suitable method for tackling the problems of the digital divide in the Netherlands?

3 RESEARCH METHODOLOGY

In this project, technical action research is executed. It means that we are not just obtaining knowledge and information but that we are aiming to find real-life solutions to the problem of the digital divide in Amsterdam. In interviews conducted during the [DigiChallenge 2.0](#), it emerged that the target group is difficult to reach. The chance of having enough participants in this study for quantitative research is highly unlikely, therefore is decided to conduct qualitative action research. Besides, qualitative action research is more appropriate here because in-depth feedback from users is invaluable for improving methods and prototypes. The methodology that is used to tackle this problem is the [ICT4D 3.0 methodology](#) [4]. The critical thing about this framework is that the user has a central position. The aim is to maintain close cooperation with the target group, the experts, and the stakeholders involved in the domain. The ICT4D methodology relies on three principles: (i) goals and objectives are set by local users, (ii) co-creation is done in partnerships, (iii) the technologies are fully adapted to the local context.

The methodology can be seen as a cyclic process of prototyping, testing, analyzing, and refining the solution where the needs and the objectives are central. In each iteration, the newest prototype is tested, evaluated, and redesigned based on the feedback from the target group. This iterative process eventually causes an evolved

⁴ Armoederegisseur

⁵ www.consultancy.nl

⁶ www.lezenenschrijven.nl

solution. In total, three iterations of prototyping, testing, analyzing, and refining are executed.

3.1 Context analysis

In the initial phase, a context analysis is executed to obtain information about the problem in real life. The Digi Challenge 2.0 is an event for people working in the social domain of the municipality of Amsterdam. This event, hosted by the municipality of Amsterdam, is used as the kickoff of the project. By interviewing experts and people that are involved in the social domain, we extract information about the real-life situation in Amsterdam and surroundings. Based on interviews with experts from the municipality of Amsterdam, a consultant of TaalDoetMeer⁷ and researchers and consultants of LostLemon⁸ a more detailed understanding of the digital divide in the Netherlands is obtained.

With the detailed information and the viewpoints of the experts in mind, a first idea is thought out. This idea is then worked out and explained to the experts working in the social domain. By brainstorming about potential improvements, the idea is revised with the feedback from the experts in mind. The idea is further processed, and potential solutions are evaluated. As soon as it is concrete and the context is clear, the network of the experts is used to come into contact with the target group.

3.2 Needs assessment

Once in contact with the target group, the needs assessment takes place. We find out if there are any problems regards reading and understanding of letters by the low literate people. First, we need to identify if the target group appreciates any help and support. If the help is appreciated, the current situation regarding understanding letters is analyzed. What are the people currently do when receiving a letter they cannot read? Are they asking others to help them, and how do they feel about that? Do they even open the letters? What do they think about using a smartphone to understand the letters? These are questions that need to be answered in a first session with the target group.

In interviews, the specific objectives of the low literate people are discovered. We ask if the people own a smartphone and discover for what purposes they use it. To check if the potential idea is a suitable solution, we extract information about the currently installed applications. We discover why they use these apps, what is best about the apps, and if they experience any problems. We also need to know if the group can download new applications and if they are familiar with QR-codes.

The initial idea is then evaluated, adjusted, and refined based on the needs and the objectives of the user. According to the first principle of the ICT4D 3.0 methodology, we ensure that the entire project is done in close collaboration with the target group. The requirement analysis can be conducted once the context and the needs are clear. In this phase, we determine the exact requirements the application should meet in order to fulfill its purpose.

⁷www.taaldoetmeer.nl

⁸www.lostlemon.nl

3.3 New or existing application?

Based on the requirement analysis, we determine if a new application needs to be created or whether we could use or improve an existing one. The feasibility, scalability, and sustainability of a potential new application will be considered. The pros and cons of creating a new application are compared against the pros and cons of using an existing application. The evaluation is done by answering the following questions:

- Which existing applications can fulfill the requirements?
- What are the needs that existing applications cannot meet?
- How can an existing application be used in order to fulfill the needs?
- How feasible is the application?
- How sustainable is the application?
- How maintainable the application?
- How understandable is the application?

3.4 Testing with letters

The potential application and method are tested with the target group. In an experimental design, the participants are asked to answer questions about a letter. Questions that will be asked to check if the information is clear:

- (1) Where is the letter about?
- (2) When is the meeting scheduled?
- (3) What is the location of the meeting?
- (4) Before when do you need to register for the meeting?

All answers can be found in the letter, and the participants are forced to use the smartphone. We do this to check if using the smartphone increases the ability to understand the letter.

The purpose of the letter is to inform citizens about a meeting about a new waste policy. The letter used in the experiment is an example letter provided by Stichting Lezen en Schrijven⁹, see Figure 18. The language level of the example letter is A2 / 1F. This level is comparable to a student who has just finished primary school. We also keep an eye on whether any simple adjustment to the letter itself can be of added value in understanding it. If interviews and observations show that simple adjustments to the letter result in more clarity, we notice this in this paper.

3.5 Evaluation

The goal of the application is to increase the understandability of letters currently not understood by the low literate people. We can measure the success of the application by checking if the participants can answer the questions about the letter. Besides, the success of the application depends on whether the low literate people experience it user-friendly and on whether the participants would recommend the approach to others. Another main issue with low literate people is that they often feel ashamed because they can not read and write¹⁰. The success of the application is, therefore, also depended on whether the users trust the application.

⁹www.lezenenschrijven.nl/voorbeeldbrief

¹⁰<https://www.lezenenschrijven.nl/over-laaggeletterdheid/feiten-cijfers/laaggeletterdheid-herkennen/>

3.6 Sustainability

To increase the probability of being continued, we will share and present the results of the project to the municipality of Amsterdam and LostLemon. In all phases of the project, sustainability aspects will be included when possible. We will consider sustainability in determining whether we will make a new app or use an existing app. Development is sustainable if it also takes into account economic, human, and social aspects: scarcity not only applies to natural resources¹¹.

4 RELATED WORK

In 2013, the PIAAC (Programme for the International Assessment of Adult Competencies) research showed that compared to other countries, there are relatively few low literate people among the Dutch labor force [5]. The same research shows that there has been an increase in the number of low literate people in the last seventeen years. Also, these low literate people relatively often have multiple disadvantages and are both low literate and low digit. In 2013, it concerned almost 1 million people with multiple disadvantages. In Maatschappelijke Achterstanden van de Toekomst, the Education Council states that there are indications that the low and highly educated are increasingly living in separate worlds: social and political participation, for example, appears to be increasingly less related to the pillar or religion and increasingly to the level of education [13]. Significant differences in skills between the top and bottom is a socially unwanted situation. The Netherlands, therefore, strives for a well-educated labor force with a high average skill level.

Much work has been done to help low literate people learn to read and write and to increase the average skill level of the population. Each year, the Rijksoverheid gives €60 million to the municipalities in the Netherlands to tackle low literacy¹². With this money, municipalities can offer courses to their residents in the areas of language, maths, and digital skills. Examples of projects that have been subsidized by the government:

- Taal voor het Leven
- Taalkoorden
- Educatie voor Vrouwen met Ambitie (EVA)
- Kunst van lezen

The common thing about these projects is that the focus is on learning to read and write. What we do differently in this study is that we try to provide direct support for problems without the low literate people being forced to learn to read and write.

4.1 Stichting Lezen en Schrijven

Another organization in this domain is Stichting Lezen en Schrijven; it was founded in 2004 by Princess Laurentien. The foundation aims to prevent and reduce low literacy in both the short and the long term. By working together with social organizations, schools, companies, and governments, the foundation wants to reduce illiteracy in the Netherlands. To ensure that low literate people can understand information, the organization has developed a list of writing tips, see Figure 19. In the development of the prototype, the

¹¹<https://www.cbs.nl/nl-nl/faq/specifiek/what-is-sustainability>

¹²<https://www.rijksoverheid.nl/onderwerpen/taal-rekenen-digitale-vaardigheden/aanpak-laaggeletterdheid>

writings tips are taken into account. Also, the foundation created a factsheet about digital skills, see Figure 20.

4.2 Steffie.nl

Steffie.nl is a product of [Leer Zelf Online](#) and was founded in 2002. Steffie is a virtual assistant designed for daily issues on the Internet. Steffie explains daily subjects in a simple way for anyone who likes a step-by-step explanation with many images. Steffie covers topics such as dating, health, personal finances, contact with the government, social networks, internet banking, claiming benefits, and traveling by public transport, for example. DigiD¹³ is one of the topics explained by Steffie. In simplified animations, people can, for example, see how to use it, how to request it, and how to log in with the DigiD app. In addition to Dutch, the animations of Steffie are also available in English, French, Tigrinya, and Arabic. In this research, the simplified way of how Steffie presents things is taken into account. In the design of the prototype, we look at how Steffie separates topics into understandable parts. Steffie covers fixed topics but does not take into account what people should do when they receive a letter about a new topic. In this research, we develop a method that can deal with such a new situation.

4.3 Snap de Brief

It is important to note that the municipality of Amsterdam commissioned a project like this before. The project is called, [Snap de brief](#). The idea was to create a mobile application where the purpose of the application is to help people when they did not understand a received letter. People could take a picture of a letter and send it with the application. They were then called back by a professional counselor who explained the letter or, if necessary, refers them to a support organization. The problem with this application is that the needs of the user are not put central during the design. The application was initially created to extract knowledge about the poverty situations in Amsterdam, and the main goal was not to help the people. The municipality of Amsterdam stopped with this project since it was not successful. This research distinguishes from the project because the needs of the user are central, and the main goal is to help the low literate people.

4.4 VraagApp

[VraagApp](#) is an app specially developed for people who find society complicated. The app allows users to ask questions about things they do not understand. The idea is that volunteers give users a quick answer to the questions. In Figure 21, we see the UI (user interface) of the app. What can be seen is that the user can ask questions about letters. One of the bottlenecks of this approach is that volunteers who know the answer are required. Another issue is that low literate people often feel ashamed of their situation. The fact that another person is involved can prevent low literate people from asking a question. In addition to that, if low literate people do not understand a letter, they may not know what to ask. In this research, we differ from the VraagApp because another person (volunteer) is not required in our approach. In our approach,

¹³DigiD stands for Digital Identity and is used in the Netherlands to login to official websites and makes use of public services.

the low literate people can handle the letters themselves, at home, without feeling ashamed.

5 CASE STUDY

This section describes the case study of this research. In the first two subsections, the context analysis and the reason why we shifted from NT1 to NT2 are explained. The subsections after that describe the needs assessment, the requirements analysis, and the three iterations of the previously presented methodology.

5.1 Context analysis

The research started at the [Digi Challenge 2.0](#), an event organized by PACT Amsterdam. The event was about the digital inclusion of citizens in the city of Amsterdam. All kind of different social organizations were invited to attend the event. During the event, we were able to listen to exciting guest speakers, such as futurologist Wim de Ridder, alderman Marjolein Moorman and 'Mayor of the Digital City' Marleen Stikker. The overarching theme of their presentations was that the digitization of society is going fast and that it is essential to pay extra attention to low literate people because the digital world can be a complex world for them. On this introduction day, it became clear that there are several urgent problems to be solved.

During the event, we attended a workshop hosted by LostLemon. The workshop was focused on the challenge of how to reach the target group (NT1) and about the different [personas](#) that make up the target group. During the workshop, it became clear that recruiting low literate people for research is challenging. LostLemon has experience with testing with the NT1 group, and they mentioned that it could take much effort to arrange a meeting.

The workshop continued with a brainstorm session with employees of the UWV (Uitvoeringsinstituut Werknemersverzekeringen). They advised thinking about simple smartphone applications that could help the low literate people with their daily issues. Multiple people confirmed during this day that the people of the target group often own a smartphone. On this day, we made contact with various organizations and planned a few appointments for interviews during the following weeks.

In one of the meetings with employees of the municipality of Amsterdam, we were told that the letters would not be translated soon. For political reasons, the letters sent by the municipality will only be sent in Dutch for the time being.

5.2 The initial ideas

With the idea to help the NT1 group in mind, two primary methods were created. After talking to different people, the question of how to ensure that low literate people can better understand written letters arose. At this moment, we wanted to find out if reading out letters, helps low literate people in understanding them. Moreover, if this would help them, how can a smartphone application be used to fulfill this purpose?

5.2.1 Audio messages. The first idea was based on the way the municipality of Molenwaard deals with low literacy. Molenwaard

is the first complete digital municipality¹⁴ and it has shown that the service offered has been improved on all fronts. The municipality of Molenwaard uses ReadSpeaker on its website to increase the accessibility of digital content for all citizens. [ReadSpeaker](#) is a software that can be used to transform the text into speech. The software can be used to give a voice to websites, mobile apps, digital books, e-learning materials, and documents. In Figure 1, we see a fragment of the website of Stichting Lezen en Schrijven. The foundation also uses ReadSpeaker on their website.

Feiten & cijfers



In Nederland hebben 2,5 miljoen mensen van 16 jaar en ouder moeite met lezen, schrijven en/of rekenen. Vaak hebben zij ook moeite met digitale vaardigheden. Dat staat gelijk aan 18%, dus ongeveer 1 op de 6 mensen in Nederland. Daarvan hebben bijna 1,8 miljoen mensen tussen de 16 en 65 jaar moeite met taal en/of rekenen. Meer dan de helft van deze groep is autochttoon.

Figure 1: Fragment of the website of Stichting Lezen en Schrijven

In this phase of the research, we wanted to find out if giving a voice to a letter increases the comprehensibility of the letter for low literate people, and how a smartphone application could be used to enable the low literate people to have the letter read aloud.

5.2.2 Instruction videos. The second idea was based on Steffie and Digi-taal. Steffie, the virtual agent makes topics more transparent by explaining them through animations and spoken messages. [Digi-taal](#) is a platform that helps low literate people with digital forms. Based on the difficulties of the low literates, the platform was created¹⁵. The platform makes use of instruction videos to help people with their forms. We wanted to find out if a smartphone application could be used to enable the low literate people to watch instructions videos belonging to a received letter. The challenge was how the instructional videos could be connected to the physical letters.

5.2.3 From NT1 to NT2. In the weeks following the event, the initial ideas were developed to help the NT1 group. By using the network of people met at the event, we tried to come into contact with the group. Multiple attempts resulted in nothing. Mails were barely answered, or it was reported that the group was preparing for an exam, leaving no time for testing. We could indeed confirm that the NT1 group is hard to reach. Due to the limited time available for the project, it was decided to shift the focus to the NT2 target group. The reason for this came about during a consultation hour in the library. The initial ideas were presented to Mariëlle in a first meeting. She was not working with the NT1 group, but she mentioned that this could also be very useful for her students. She indicated that some students understand spoken language much better than written language. This was the reason to shift the

¹⁴<https://www.digitaleoverheid.nl/achtergrondartikelen/molenwaard-digitaal-en-dichtbij/>

¹⁵<https://www.omroepzeeland.nl/nieuws/107959/Dankzij-deze-filmpjes-kunnen-laaggeletterden-veel-meer-dan-je-zou-denken>

attention to the NT2 target group and to continue developing a method that helps in understanding letters. Ultimately, this is also a target group that has to deal with the digital divide, as stated in De Bouwstenen voor Digitale Inclusie report [8]. It can happen with practical action research that the target group changes.

Mariëlle van Rooij is language consultant of [Taal Doet Meer](#) and NT2-teacher at the [NVA](#) (bureau for integration and participation). She invited me to test the method with her language class. Taal Doet Meer is an organization with more than 900 volunteers that ensures, for more than 30 years, that non-native speakers can participate in today's society. By attending language classes, I could interview the people from the NT2 group and identify the needs and objectives of this group.

5.3 Needs assessment

In a language class about Koningsdag (King's day), given in Amersfoort, the needs and objectives of the NT2 group were determined. Twelve participants from all over the world attended the class. People from Syria, Iraq, Eritrea, Gambia, and Ethiopia who are learning Dutch attended the class. The age of the participants is between 25 and 55 years. The participants of the language class are exempt from the national integration course but are obliged to follow 600 hours of Dutch language lessons as compensation.

In the first part of the class, I had the opportunity to introduce myself and tell something about the reason why I was attending the class. After we were introduced to each other, the group continued with their weekly personal assignments. At the same time, I had the opportunity to individually ask the participants questions that were relevant for the research.

- Do you experience problems with reading letters?
- What is the most difficult thing about these letters?
- What do you do when you receive these letters?
- Who are you asking for help and how do you feel about that?
- Would you be happy if the letters were read out for you?
- Are you in possession of a smartphone and which one?
- What smartphone applications are you using right now?

In the first session, five participants were interviewed. Four of the five participants had Arabic as their native language, and one of them speaks Tigrinya. All of the five participants mentioned experiencing problems when they received a letter. None of them was able to comprehend the full content. They all indicated that the language level of the letters is too difficult for them. The letters are often too long and contain multiple difficult words. Four of the five participants reported that they usually bring the received letters to the NVA and ask their contact person for help. The other participant mentioned asking the neighbors for support with the letters. All mentioned that they sometimes feel ashamed of this situation, especially when the letters contain private or medical information. All participants confirmed that they understand the letters better if they were read to them by someone else. All five participants owned a smartphone with Internet, and they were all able to download new applications. Examples of applications installed on their smartphones were: WhatsApp, Facebook, Viber, ING/Rabobank, and NS Reisplanner.

In the first interviews, it became clear that the NT2 group had problems with received letters and that they would appreciate help in understanding these letters. It also became clear that spoken language is better understood than written language and that all participants in the group owned a smartphone that is used in their daily life. The participants were all able to download new applications and know how to take photos and how to send them. At the end of the interviews, I showed a simplification of the initial ideas described in section 5.2. All of the participants mentioned being more interested in the application that enables the users to have the letter read aloud than an approach where they needed to watch instruction videos belonging to the letter.

After the interviews, one of the participants showed a real letter that was not understood. It happens more often that students take letters to class to ask for help. Together we made a picture of the letter and used the Google Translate App to read it out loud. We first listened to the Dutch version of the spoken letter, followed by the English version. By using this method, the participant understood the content of the letter and now knew what to do. She told me that she was happy with this approach because she no longer needed to take letters to her contact person, an exciting finding.

At the end of the class, I took some pictures of the group in their orange clothes, which they wore because of Koningsdag. I was told that the group picture would be the new image of their WhatsApp group. All of the participants are part of the WhatsApp group, meaning that all twelve own a smartphone. Important to note is that the WhatsApp group is used to do weekly assignments at home. For that week, the participants were asked to make pictures of their experience of Koningsdag because the royal family came to Amersfoort.



Figure 2: Participants of the language class

5.4 Requirement analysis

Based on the interviews of the first session, the main requirements have been determined. It can be concluded that the solution to better understand letters should be delivered in the form of a smartphone application. The requirements are split into functional requirements and quality requirements.

5.4.1 Functional requirements. In Figure 3, the overall functionality of the application is presented in a design view. The view shows how the low literate people can make use of the application to understand letters. The user should be able to make a picture of the letter (requirement 1). Once the user has made a picture of the letter, the written text needs to be transformed to spoken text (requirement 2). The written letters of the photo first need to be transformed to digital text. The technique used for this is called Optical Character Recognition (OCR) and is an important and widely used technology [12]. The digital text can then be processed and transformed to written text.

Since low literate people of the NT2 group have another language than Dutch as their native it is valuable to translate the text (requirement 3). The smartphone settings and the content of the currently installed applications could be in another language. Therefore, we need to ensure that the application supports multiple languages (requirement 4). An overview of the functional requirements is presented in Table 1.

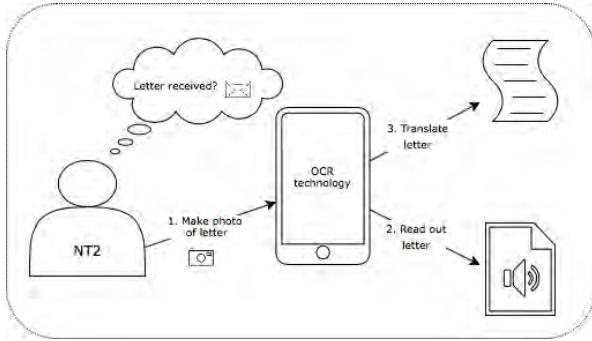


Figure 3: Design view

Name	Description
Camera	The user should be possible to make a photo of a received letter.
OCR	The software then needs to recognize optical characters (OCR) and transform a photo of written text into spoken text.
Translate	Translate the content of the letter.
Languages	The application needs to be able to support multiple languages in order to be used by users of the NT2 group.

Table 1: Functional requirements

There were two options for a potential smartphone application. The first option is to create a new application based on functional

requirements. The second option is to use an existing application that already fulfills all functional requirements. I concluded that the Google Translate app is an existing app that fulfills all functional requirements. In section 5.4.2, we elaborate on why the option to use the Google Translate app has been chosen.

5.4.2 Quality requirements. Based on the quality requirements, there has been decided whether a new application was created or an existing application was used. In order to make a grounded decision we used the QOC (Questions - Options - Criteria) modelling notation [11]. In Table 2, the considered quality requirements are presented. In the QOC-model (Figure 4), the decision to use an existing application is presented.

Name	Definition
Feasibility	This term is used to determine whether one has the technical expertise to handle completion of the project.
Sustainability	Sustainability is concerned with the well-being of future generations and in particular with irreplaceable natural resources [10].
Maintainability	Maintainable systems can easily be made to function if they are broken or not appropriate to the task at hand [3].
Understandability	The concept that information should be presented so that a user can easily comprehend it. In this case, the information presented in the application should be understandable for low literate people.
Usability	The extent to which a mobile application can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use [15].

Table 2: Quality requirements

Rationale for decided option #2 Based on the quality requirements, there has been decided to use an existing application that fulfills all functional requirements. In terms of feasibility, the time available for the project is approximately five months, in this time, it is a big challenge to create a whole new application and test the application with the participants. Besides, the main goal is to help the participants with understanding letters. The objectives of the participants would have gotten less attention if the main goal was to create a new application in the available time. When choosing an existing application, we do not need to worry about the feasibility of the application.

In terms of sustainability, it is better to use an existing application. A new application must be hosted, which consumes additional energy. Also, a mobile application needs maintenance, and the chance that the new application is maintained after the project is finished is not that likely. If the new application would be broken after the project, it is less likely that it would be fixed. The benefits of creating a new application are that it can be designed entirely based on the needs and objectives of future users. Although this seems to

be a significant advantage, the first tests in the first session with the NT2 group also indicated that the existing application was understandable for the low literate people. In addition to the fact that the quality requirements are to the advantage of an existing application, there are also hosting and maintenance costs if we would develop an app ourselves. In contrast, using the Google Translate app is free. We do not need to discuss any possible patent rights in this study because this is out of scope.

Our second concern was whether we should use the existing UI (User Interface) of the Google Translate App or whether we should create a new one. Moreover, if we use the existing UI, how can it be used to help low literate people in understanding letters? In the next section, we elaborate on the iterative methodology used to find answers to these questions.

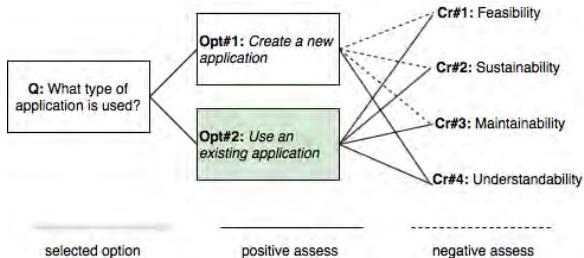


Figure 4: QOC-model of decided application type

5.5 Second test session

Two weeks after the first session, I participated in a second language class in Amersfoort. In the time between the two sessions, there has been decided to use the Google Translate app. The goal of the second session was to find out if the app indeed can contribute to understanding letters. Besides, we needed to find out if the existing UI could be used or whether a new UI would work better. In an experimental setup, five participants were individually asked if they could identify the subject of some test letters (Figure 22 & 23) without using their smartphone. Important to mention is that the test letters differ from the test letter described in Section 3.4. The municipality of Amsterdam provided the tests letters used for the second session. None of the five participants could mention the subject and the goal of the letters without the usage of their smartphone. This was expected since the participants are still in the first phase of learning Dutch. They reported that the words were too complicated and that they could not make a whole story out of it. The participants again confirmed that they would have asked someone for support when they would have received such a letter in practice. It was a pleasure to hear that none of the participants threw away the letters while leaving them unopened.

5.5.1 Testing with Google Translate app. Four of the five participants had the Google Translate app already installed on their smartphone and mentioned to use it to translate individual words. The participant that did not have the Google Translate app immediately downloaded and installed it. Unfortunately, we discovered that Google Translate is not supporting her native language, Tigrinya.

She showed me that she currently used the 50 languages app to translate individual words. Fortunately, this participant will soon be able to use Google Translate¹⁶.



Figure 5: Testing with the Google Translate app

In the next phase of the test, the participants were asked if they could tell what was meant with the letters by making use of their smartphone. The functionality of how the app can be used to read out a letter was demonstrated ([Instructions](#)). The participants preferred to have the translated (Arabic/English) text readout instead of the Dutch text. Three of the participants translated the letters to Arabic, and one translated the letters to English. The participant who speaks Tigrinya used the app to have the Dutch text read out. By using the app, the participants could tell what was meant with the letters. They all knew the subjects of the letter, but the translation delivered by Google Translate was doubtful since the precise details were still a bit vague. One of the things discovered was that participants thought that the salutation (the address details and the date information) needed to be translated. This resulted in some confusion. A disadvantage of the app is that it does not recognize that this information should not be taken into account when translating the critical parts of the letter. In the following weeks, it was a challenge to find a solution to this problem. Below the important things learned from the session are itemized.

- The OCR technology of the Google Translate app worked 100% secure on the example letters used for the second test session.
- Google Translate could not deal with the native language of Eritrea (Tigrinya).
- After a demonstration the participants understood how to use the Google Translate app. The current UI is understandable for the NT2 group.
- People do not always understand the structure of a letter and can possibly not determine important parts.
- The translation of the Google Translate is not always perfect.

¹⁶<https://www.trouw.nl/cultuur/binnenkort-in-google-translate-het-tigrinya-met-dank-aan-rotterdamse-eritreers af3c860c/>

5.5.2 User interface. In Figure 6 the QOC-model of the User Interface is presented. Based on the quality requirements there has been decided to use the existing user interface of the Google Translate app.

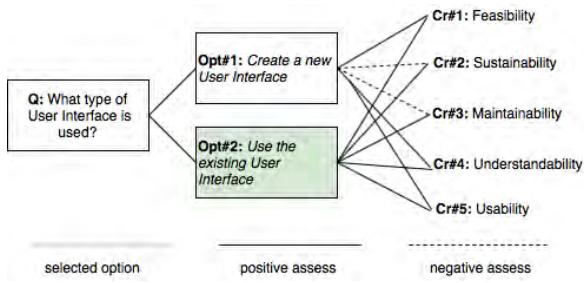


Figure 6: QOC-model of decided user interface type

Rationale for decided option #2 The most important criteria here to consider are understandability and usability. It is essential that the users can understand the application and efficiently use the required functionality. From the tests of the second session, there can be concluded that the current user interface is understandable and pleasant to use for the NT2 group. When considering the other quality requirements, there can be concluded that using the existing user interface is more sustainable. Using the functionality of an existing application with a new user interface means that in the end, a new application needs to be hosted. This results in more energy consumption, which is not sustainable if a properly functioning user interface is already available. Regarding maintenance, it is also wiser to use an existing user interface. It would have been feasible to come up with a new user interface in the available time, but less attention would have been gone to finding a method to ensure that the application is used in practice.

In the weeks between the second and third session, consideration was given to how to deal with the shortcomings of the application and how to ensure that the application will be used in practice.

5.6 Third test session

After the second session, we knew that the Google Translate app with the existing user interface was suitable to read out the letters. Also, we concluded that the app is also suitable for translating the text, which contributes to comprehending the letters. Together with the teachers of the school, I looked at what would be a good way to ensure that the students of the school would use the app. We then came up with the idea of making an infographic of the steps involved in the process. The infographic can be hung as posters in the school, presented on our website and digitally broadcast on screens. In this way, the visitors of the school can continue to watch the approach and use the approach even after the project has been completed. In a later section, several methods to promote and stimulate the approach will be discussed.

5.6.1 Feedback for the infographic. The infographic shows a step-by-step approach of how the Google Translate app can be used. In Figure 7 the initial version of the infographic is presented.

The infographic has been tested with three people who have full command of the Dutch language. In addition, these three people use their smartphone daily and have the necessary digital skills. These tests were done to remove the fundamental errors from the infographic before it was tested with the real target group.



Figure 7: First version of infographic

Before testing the infographic with the NT2 group, two teachers were asked to give their feedback. Because they are in daily contact with the target group, they know what the NT2 group can and cannot understand. Initially, an English version and a Dutch version of the infographic were made. However, it was not recommended to use English because this was generally not a language that the target group mastered and because it was in conflict with the purpose of why Dutch lessons were followed. Therefore, there has been decided to continue with the Dutch version of the infographic. Below we itemize the improvements done on the initial version based on the feedback of the teachers.

- *Brief ontvangen:* the font is unclear and contains hard to understand letters for the NT2 group. The font has been changed to a font similar to Verdana, as suggested in the factsheet.
- *ontvangen:* this word has been changed to gekregen. We used the [website](#) suggested in the factsheet of Stichting Lezen en Schrijven to find an easier word, see Figure 8.

- *Gebruik de google translate app:* this part contains difficult words and the goal is not clear. It is suggested to make a clearer description for what purpose the infographic can be used. In addition, change 'Google Translate app' to smartphone since this is a word that is known by the NT2 group.
- *Open de Google Translate app op uw smartphone of tablet:* this part has been changed to 'open de app op je smartphone'. The same is said with less long and less difficult words.
- Step 4 is a complex step and is probably not clear. The suggestion was to test this test good with the participants and split it eventually in multiple steps if it gives problems.
- *Luister en bekijk de vertaling:* this has been changed to 'Luister en lees de vertaling' since it more describes the goal of what to do.
- A general suggestion was to use more symbols and increase the font size.



Figure 8: Suggestion of www.zoekeenvoudigwoorden.nl

After the discussion with the teachers, there was time for testing the infographic with one of the participants. The initial version of the infographic was only tested with one participant. Unfortunately, there was not enough time to test it with more participants. For future research, it would be valuable to test the infographic with more participants. For the final test, the participant was given the official test letter presented in Figure 18. To make the essential parts more clear a marking has been added to the letter, see Figure 10. Important to mention is that the participant was not able to read and understand the letter and that the native language of the participant is Arabic. The infographic was printed out, and the Google Translate app was already installed on his smartphone. By using the app, the participant was asked to decipher the letter. After the letter was deciphered, the participant was asked to answer the questions presented in Section 3.4 and indicate if something was not bright. In Figure 9, a setup of the test is presented.

5.6.2 Final test. In the final test, the participant had some issues finding the Google Translate app on his smartphone. Therefore we decided to add a logo of the application to the first step of the



Figure 9: Experimental setup



Figure 10: Example letter inclusive markings

infographic. In the second step, there was some confusion. In the Netherlands, we read and write from left to right. The second step of the infographic was designed based on this principle, but for the participant, who has Arabic as a native language, this was confusing. Since the Arabic script is from right to left, we decided to make the second step clearer by adding the Arabic option to the step. The third step could be carried out without problems. The fourth step was problematic; the participant indicated that the picture was too small and that he did not know what to do. As suggested by the teachers, there has been decided to split this step. By demonstrating what to do in this step, the participant could continue with the approach. The fifth step was again too small,

and there has been decided to use a more zoomed picture. Below the improvements are itemized. In Figure 12, the final version of the infographic based on the feedback of both the teachers and the participant can be found.

- *Logo:* a logo of the Google Translate app is added to the first step. The participant was searching on his phone but it took a while before it was found. By adding a logo of the app we try to reduce the search.
- *Arabic differences:* in the Netherlands we read and write from left to right. The second step of the infographic was designed based on this principle. For the participant who has Arabic as native language this was confusing. By adding the Arabic option to the infographic we try to reduce the confusion.
- Step 4 was experienced complex. It was not clear when the user was ready to go to the next step. This step has been split into two steps. In the fourth step the user is now asked to mark the words in the red text box and in the fifth step we check if all words are correctly marked. By splitting the task into two parts we try to reduce the complexity.
- The picture in the fifth step was experienced small. Therefore there has been decided to increase the size of the picture.

Once the user was able to follow the steps of the infographic, we saw that the application functioned well on the first red marked text box. The participant could tell the subject of the letter and was able to mention the date of the meeting. The second red marked text box gave more problems. The answers to the third and fourth questions of Section 3.4 could be found in this box, but the participant was not able to answer the questions. The lowest text box does not contain smooth sentences. This resulted in the fact that the spoken and translated text messages did not make sense to the participant. When I showed the adjusted version of the letter (Figure 11), the participant could tell me before when he needed to register for the meeting. He mentioned that this part was more comfortable to comprehend since it contained less information. At the end of the final test, the participant told me that he would use this approach in practice and that he will demonstrate it to his wife.

After the experiment, we returned to class. During the lesson, the participant still had to do little reading and writing assignments. Remarkably, he used the Google Translate app for this in the same way as explained in the infographic. Of course, this is not the intention for reading and writing assignments, but it was good to see the method being used so quickly.



Figure 11: Adjusted text box



Figure 12: Final version of infographic

5.7 Evaluation

The main goal of the final test was to find out if the application contributes to understanding letters. By following the approach suggested in the infographic, the participant could answer the first two questions described in Section 3.4 correctly. Without help, the participant was not able to answer the third and fourth question correctly. What was observed was that the participant had trouble when the application processed too much information. When splitting the information, the comprehensibility increased. The fourth question could be answered correctly after the letter was slightly adjusted. Even though not all questions were initially answered correctly, we saw that the participant now had an idea about the purpose of the letter. Without the application, the participant would have had no idea what to do and needed to bring the letter when visiting the NVA.

It has been observed, and it can be concluded that the NT2 group can handle the Google Translate app well. Questions about the user-friendliness of the app were answered purely positively. In the first session, I showed someone of the group how to use the Google Translate and in the second session, she came back to me and told me that she had used it in the meantime. She said that she made an appointment based on a received letter and that she did not need to ask the NVA for help.

When asking the NT2 group whether they would recommend the Google Translate App to others, there were again purely positive answers. The participant of the final test even mentioned that he would demonstrate the approach to his wife.

To give a more grounded conclusion if the app works in practice, more people should be tested, and several test letters should be used. The feedback from these tests could be used to improve the infographic further.

The consideration to develop a new application was based in particular on the fact that it can then be developed according to the needs and objectives of the low literate people. However, during the sessions, we have seen that the existing Google Translate app functions well and is understandable for the target group. In addition to being a free and sustainable solution, the application is also continuously being improved. More than 100 billion words are being translated each day¹⁷. The Artificial Intelligence (AI) capability of Google Translate ensures that the system is self-learning. In addition to that, when Google Translate suggests a wrong translation, one can recommend an improvement. The service is currently supporting more than a hundred languages, and more languages are approaching. Besides all benefits, a recent news report also showed that Google's translation machine still has a lot to gain in the area of discrimination, for example.¹⁸. For the time available for this project, the existing application offered the most suitable solution.

6 DISCUSSION

This section is used to discuss the methodology and the results of the case study. Elaboration of future research is done, and recommendations are given.

6.1 ICT4D 3.0 framework

For this research, the ICT4D 3.0 framework was used, and one of the sub-questions of this research is whether the ICT4D 3.0 framework would be a suitable methodology for tackling the problems of the digital divide in the Netherlands. In this research, we have seen that following the framework led to a sustainable solution. Even though no new application design has been created, we came up with a methodology that can help the low literate people with one of their daily issues. The ICT4D 3.0 framework is based on three principles: (i) goals and objectives are set by local users, (ii) co-creation is done in partnerships, (iii) the technologies are fully adapted to the local context. In this research, the goals and objectives of the low literate people were discovered during a language class in Amersfoort. By discovering the needs in the initial phase of this project, we could better look for a solution that was suitable for the target group. The approach to help the low literate people has been developed in co-creation with the group. In an iterative way of designing, testing, and evaluating the application was chosen, and a corresponding infographic was created. The third principle was less relevant for this research than for research in low-resource contexts, for example. What we found out was that the low literate

¹⁷<https://www.yuqo.nl/10-feiten-over-google-translate/>

¹⁸<https://nos.nl/artikel/2286930-kan-kunstmatige-intelligentie-racistisch-of-seksistisch-zijn.html>

people of the NT2 group own a smartphone with access to the Internet. Therefore, there has been decided to develop a solution suitable for the smartphone.

6.2 Do not reinvent the wheel

In this research, there has been chosen to work with an existing application. In cooperation with the target group, the needs and objectives were discovered, and the requirements for the applications were set. While considering to build a new application, we concluded that we did not need to reinvent the wheel. Using an existing application is more sustainable, and the current application was experienced user-friendly. In previous ICT4D projects, it is more common to design and redesign a new solution for a problem. Although no new solution was designed, we came up with an approach to help the low literate people with a daily problem. Why should we eventually reinvent the wheel if existing solutions are available?

6.3 Recommendations for the letters

During the research, we paid attention if a simple adjustment to a letter could be of added value in understanding it. What we discovered during the tests was that the low literate people could not distinguish between the salutation and the essential sentences in the letter. Using the google translate app became a lot easier after adding a red text box around the critical parts. In cooperation with the people who determine what is essential, the letters could be a little bit adjusted so that the usage of the application is easier. It would, for example, be interesting to research if the approach presented in Figure 13 would increase the comprehensibility of the letter for the low literate people.



Figure 13: Text box with functional symbol

One of the advantages of Google Translate is that it is possible to make suggestions for a better translation. When in practice it appears that the approach described in this study works, I recommend writing letters, that are known to be 'read' by many NT2 people, in a way so that the translated version is also understandable. In this way, we could increase the probability that the information is better received by this target group.

6.4 Sustainability

Sustainability is an important factor in the successes of ICT4D projects. In this project, this factor was decisive, especially when choosing between creating a new application or using an existing application. Because it merely costs more energy to host and

maintain an additional application, it is a sustainable choice to use an existing application. To ensure that the research does not stop after my project has ended, we decided to share the outcomes with the municipality of Amsterdam and LostLemon. Also, posters are donated to the school, and we ensure that the infographic and the research are published on our website.

6.5 Future work

First, it would be good to test the infographic with multiple users. The feedback and experience can then be used to develop the infographic further. Also, it would be good to test the final version of the infographic and improve this again based on the feedback and observations. Besides, it would be interesting to test the approach with other letters.

The initial goal was to help the low literate people in the NT1 group. Because this group was difficult to reach, it was decided to switch target groups. It would still be interesting to investigate whether reading out letters to the NT1 group also helps to understand letters. Moreover, if it would help the NT1 group, could then the same application be used? Is the Google Translate app user-friendly for the NT1 group? Alternatively, would it be necessary to develop a new application based on the needs and objectives of this group? Interesting research will be to see if the NT1 group needs a different approach than the NT2 group.

For further research with the NT2 group, I would recommend working with a translator. Because the participants in this research did not speak English, and just a little Dutch, it was sometimes hard to communicate. Due to communication problems, the feedback given by the participants was not always clear.

6.6 Into practice

To ensure that low literate people more use the method, we made sure to donate posters of the infographic. The infographic is also available on our website and can be downloaded for free. It is interesting to investigate whether an instructional video contributes to the comprehensibility of the approach. Also, it is interesting to investigate whether an instructional video in the same style that is used on [Steffie.nl](#) helps to reach more people. To follow up on this, the research will also be sent to the organization behind Steffie.

7 SUMMARY OF RESEARCH FINDINGS

In this section, the most important findings of the research are summarized. In addition, answers to the research questions are given.

The main research goal was to find out how could low literate people be supported in understanding letters by the use of a smartphone. Based on a user-centered approach we concluded that low literate people, who have Dutch as a second language, can be best helped by an application that enables them to listen to the letter and to translate the letter. In a small experiment, we have seen that this increases the comprehensibility of the letter. Without the use of the application, the low literate people were not able to answer the most important question of the letter. With the use of the application, the low literate people could answer the questions correctly. We have concluded that the existing Google Translate app meets the functional conditions. Based on feasibility, sustainability,

maintainability, understandability, and usability, there has been decided to use the existing app and to develop an infographic that describes a step-by-step approach of how the application can be used.

We have seen that the low literate people experienced problems with the letters in practice and that they are open for advice and methodologies to be helped. We concluded that the smartphone is a perfectly suitable device to help the low literate people. As stated in the Bouwstenen voor Digitale Inclusie report, the smartphone is by far the most used device. We can confirm this, and we can also confirm that the low literate people from the NT2 group possess the necessary skills. The main barrier for the NT2 group is the difference in language. This barrier can be reduced by using the Google Translate app. By stimulating and optimizing the use of the application, we can perhaps ensure that low literate people from the NT2 group are a bit more digitally included.

8 CONCLUSION

From this research we can conclude that, in order to reduce the literacy gap for low literate people with Dutch as second language, digital applications can be useful for the target group, provided that the digital solutions are well adapted to the needs of the targeted user group. User evaluations of proposed solutions show that the target group can be better supported if they are closely involved in the design, adaptation and evaluation of digital solutions. This research has shown that an iterative, adaptive, collaborative approach, embedded in a user-centered, sociotechnical approach is promising in finding solutions that can support low literacy in the context of migrants in the Netherlands and help bridge the Dutch Digital Divide.

Research of fellow students Marc Hegeman and Carlbandro Edoga has shown that the methodology used, is also promising in finding suitable applications for homeless people in Amsterdam. In their research they have shown that, by involving homeless people in the process of developing and evaluating, innovative smartphone-based applications are promising in bridging the digital gap in Amsterdam. Research conducted by Derek van den Nieuwenhuijzen shows that the digital divide can be reduced by involving people in the process of virtual agent creation. Again, the ICT4D 3.0 methodology seems to be a promising framework that can be used for the digital inclusion of citizens in Amsterdam. As long as we make sure that the needs and the objectives of the users are put central, developing and evaluation is done in co-creation with the end users, and the technology is fully adapted to the local context, the methodology can result in promising solutions from which the digital excluded people in the Netherlands can benefit.

ACKNOWLEDGMENTS

I want to thank Mariëlle van Rooij, language consultant of Taal Doet Meer. I appreciate her advice and her willingness to having me during the language courses she hosted. Special thanks go to the participants of the language course who helped me with my project. It was an honor for me to be a participant during their classes. I also want to thank Ingrid Nooijens, Frank Willemsen, and Georgette Lourens from the municipality of Amsterdam who gave me advice for a particular research direction and for sharing

valuable letters that I used during the research. I also want to thank Jasper Muskiet, Lennard Horstink, and Rebecca van der Meer from LostLemon who provided insight and expertise that greatly assisted the research.

REFERENCES

- [1] Gemeente Amsterdam. 2018. *Coalitiea akkoord: Een nieuwe lente een nieuw geluid*.
- [2] Rob Bijl, Jeroen Boelhouwer, and Annemarie Margot Wennekers. 2017. *De sociale staat van Nederland 2017*. Sociaal en Cultureel Planbureau.
- [3] Peter Bleed. 1986. The optimal design of hunting weapons: maintainability or reliability. *American antiquity* 51, 4 (1986), 737–747.
- [4] Anna Bon. 2016. ICT4D 3.0. - An adaptive, user-centered approach to innovation for development. (03 2016).
- [5] Marieke Buisman, Jim Allen, Didier Fouarge, et al. 2013. PIAAC: Kernvaardigheden voor werk en leven. *Journal of Health Economics* 31, 3 (2013), 490–501.
- [6] Marieke Buisman and WA Houtkoop. 2014. *Laaggeletterdheid in kaart*. Ecbo, Expertisecentrum Beroepsonderwijs.
- [7] Benjamin M Compaïne. 2001. *The digital divide: Facing a crisis or creating a myth?* Mit Press.
- [8] Armoederegisseur gemeente Amsterdam. 2017. *Bouwstenen voor Digitale Inclusie*.
- [9] Stephen G Katsinas and Patricia Moeck. 2002. The digital divide and rural community colleges: Problems and prospects. *Community College Journal of Research & Practice* 26, 3 (2002), 207–224.
- [10] Tom Kuhlman and John Farrington. 2010. What is sustainability? *Sustainability* 2, 11 (2010), 3436–3448.
- [11] Allan MacLean, Richard M Young, Victoria ME Bellotti, and Thomas P Moran. 1991. Questions, options, and criteria: Elements of design space analysis. *Human-computer interaction* 6, 3-4 (1991), 201–250.
- [12] Shunji Mori, Hirobumi Nishida, and Hiromitsu Yamada. 1999. *Optical character recognition*. John Wiley & Sons, Inc.
- [13] Onderwijsraad. 2011. Maatschappelijke achterstanden van de toekomst. (2011).
- [14] Algemene Rekenkamer. 2016. *Aanpak van laaggeletterdheid*. Algemene Rekenkamer.
- [15] Viswanath Venkatesh and Venkataraman Ramesh. 2006. Web and wireless site usability: Understanding differences and modeling use. *MIS quarterly* (2006), 181–206.
- [16] Het Centraal Bureau voor de Statistiek. 2016. *ICT-vaardigheden van Nederlanders*.

APPENDIX

A WEBSITES

To inform everyone who helped us during the project and for those who were interested in the project, we created a website (www.digitize.amsterdam). The website was used to publish blogs of events and meetings. It is also used to present overarching information on the project and information about the theses of fellow students. For more valuable information about this project and similar projects, we refer to the W4RA website (www.w4ra.org), to the website of PACT Amsterdam (www.pact-amsterdam.nl) and the website of LostLemon (www.lostlemon.nl).

B EXTRA FIGURES



Figure 14: The digital governmental goals

DEMOCRATISERING EN DE DIGITALE STAD

Samen maken we Amsterdam

Bewoners hebben net zulke goede, zo niet betere, ideeën als het stadsbestuur. Wij streven naar een open en transparant bestuur, een naar buiten gerichte organisatie die open staat voor maatschappelijk initiatief en een gebiedsgerichte werkwijze. We voelen het als onze verantwoordelijkheid om de zeggenschap van bewoners te vergroten. Niet door nieuwe stelsels maar door met de stad het gesprek en debat aan te gaan over hoe dat kan.

Democratisering

- Samen met de stad stellen we een ambitieuze agenda voor democratische vernieuwing op waarin we onderzoeken hoe de participatieve en representatieve democratie kunnen worden vernieuwd, versterkt en uitgebreid. Doel is inwoners van Amsterdam groter zeggenschap te laten hebben over hun directe omgeving, gemeentelijke dienstverlening en de stad als geheel.
- We versterken met maatschappelijke partners zoals debatcentra en initiatieven de betrokkenheid van burgers bij de stad en de politieke besluitvorming. Nieuw beleid maken we waar mogelijk samen met de stad. Beleidsstukken krijgen daarom standaard een participatieparagraaf waarin inzichtelijk is gemaakt op welke manier Amsterdammers betrokken zijn geweest en wat er met hun inbreng is gedaan.
- We leggen buurtrechten vast en gaan experimenteren op basis van ervaringen in andere steden.
- We gaan buurbegroten invoeren.
- We stellen per buurt een buurbudget in. Het stadsdeelbestuur kan (binnen kaders), in overleg met de buurt, besluiten over de bestemming.
- Buurtinitiatieven krijgen alle ruimte en we onderzoeken hoe we deze beter kunnen ondersteunen.
- Er komt een fonds voor maatschappelijk initiatief waar kleinschalige initiatieven een beroep op kunnen doen.
- We creëren fysieke en vrije ontmoetings- en ontwikkelplekken in de stad (zoever mogelijk op buurtniveau). Een deel van het gemeentelijk vastgoed kan hiervoor worden ingezet. Er wordt gezocht naar combinaties van werkplekken met gebiedsmakelaars en handhavers. We creëren co-creatieve plekken in alle stadsdeelkantoren.
- De gemeente ondersteunt actief het opzetten van commons bij voorbeeld energietransitie, zorg of het opzetten bij buurtactiviteiten. De gemeente deelt best practices en geeft juridisch advies.

Amsterdam sluit zich aan bij het Fearless Cities Netwerk: een internationaal verbond van gemeentes die zich onderdeel voelen van een internationale 'municipalistische' beweging. Hierin staan onder meer verdieping van de lokale democratie en andere beleidsterreinen centraal. Doel is uit te wisselen met, en te leren van andere deelnemende steden. We organiseren in 2020 de jaarlijkse Fearless Cities conferentie.

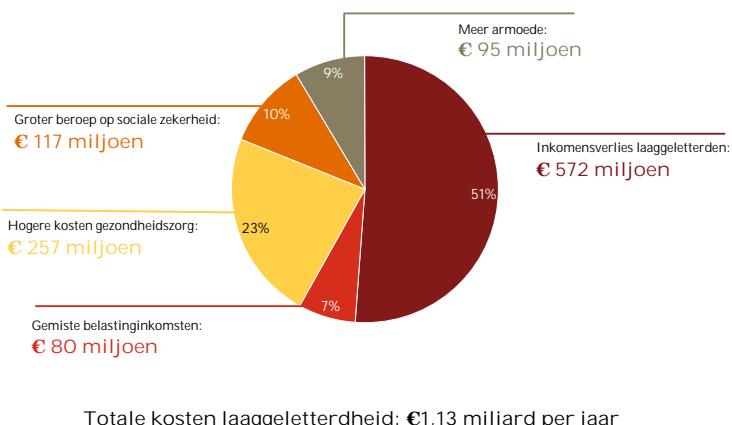
Digitale Stad

- Er komt een Agenda Digitale Stad waarin concepten worden uitgewerkt voor digitale dienstverlening en participatie (moderne, open overheid), cybersecurity en veilige digitale infrastructuur en data-sovereiniteit.
- We blijven aandacht hebben voor mensen die moeite hebben met digitalisering.
- De digitale stad richt zich op de opgaven van de stad. Daarvoor maken we een goede digitale infrastructuur om de mogelijkheden goed te benutten en goed te kunnen handhaven.
- We werken waar mogelijk met open source en open data.
- Dataminimalisatie wordt de norm. Data wordt alleen verzameld als dat nodig is en er toestemming voor is gegeven. Amsterdammers krijgen inzicht in hun eigen gegevens binnen het wettelijke kader. De manier waarop burgers regie hebben over data die ze met de gemeente delen wordt vastgelegd.
- We ondersteunen cooperaties die een alternatief willen bieden voor platform-monopolisten.
- Wifi-tracking door bedrijven wordt verboden.
- Voor het maken van kenizes is toegankelijke informatie cruciaal. De gemeente Amsterdam zorgt er daarom voor dat alle inwoners toegang krijgen tot belangrijke keuze informatie. Dat is niet alleen goed voor een sterke lokale democratie maar ook voor het versterken van de zeggenschap van inwoners, besluitvorming, beleid, verantwoording en de besteding van publieke middelen en de resultaten daarvan.
- De gemeente Amsterdam gaat uit eigen beweging meer informatie openbaar maken. Er komt een informatiecommissaris die samen met de gemeentelijke privacy officer ervoor zorgt dat de uitgangspunten 'open tenzij' en 'privacy by design' worden gewaarborgd, aangegaagd en gehandhaafd. Inwoners moeten in staat worden gesteld om beleid beter te volgen en gericht input te kunnen leveren. Voor meer zeggenschap, hebben zij niet alleen betere toegang tot keuze informatie nodig, ook belangrijke informatie over wat er in hun buurt nodig is en de besluitvorming daarover is daarbij onontbeerlijker.
- Raadsinformatie, WOB-verzoeken en documenten worden toegankelijk. Het 'tada, duidelijk over data'-manifest wordt geïmplementeerd. Dit manifest biedt een handleiding om bewust om te gaan met de mogelijkheden en bedreigingen van digitale technologieën, voor het beschermen van burgerrechten en voor eerlijke toegang tot, en het eerlijk verdelen van de opbrengsten van digitale technologieën.

Figure 15: Coalition Agreement of Amsterdam 2018: Digitale stad

Samenvatting & voornaamste conclusies

Figuur 1: Maatschappelijke kosten van laaggeletterdheid in Nederland per jaar, per categorie



Figuur 1 geeft een samenvatting van de maatschappelijke kosten van laaggeletterdheid in Nederland per kostenpost, per jaar. Daarbij wordt uitgegaan van 2,5 miljoen laaggeletterden, zoals bepaald door de Algemene Rekenkamer.

Meer dan de helft van de kosten is gerelateerd aan het verminderde inkomen voor laaggeletterden en de lagere kans op een baan. Laaggeletterden zijn vaker werkloos en hebben dan een lager inkomen en wanneer zij zouden werken. Als laaggeletterden een baan hebben, hebben zij gemiddeld lagere salarissen. Vanwege de lagere inkomsten van werkende en niet-werkende laaggeletterden, ontvangt de overheid vervolgens minder belastingen. Het bedrag van 80 miljoen aan gemiste belastinginkomsten in figuur 1 is overigens exclusief sociale premies, wat neerkomt op nog ruim 250 miljoen euro extra. Tegelijkertijd geeft de overheid meer geld uit aan bijstandsuitkeringen en aan armoedebestrijding onder laaggeletterden.

De hogere kosten voor de gezondheidzorg betreffen een tweede belangrijke kostenpost. Laaggeletterden hebben vaker een ongezondere levensstijl en chronische ziekten en hebben een grotere kans op het verkeerde gebruik van medicatie. Als gevolg gaan laaggeletterden vaker naar een huisarts en vaker naar het ziekenhuis.

Ten slotte heeft laaggeletterdheid ook een aantal belangrijke immateriële effecten. Laaggeletterdheid heeft een belangrijke invloed op de mate waarin mensen participeren en vertrouwen heeft in de samenleving. Zo hebben laaggeletterden, door laaggeletterdheid, minder het idee dat ze invloed hebben op de politiek, doen ze minder vrijwilligerswerk en hebben ze minder vertrouwen in de medemens. Ook zorgt de slechtere arbeidsmarktpositie van laaggeletterden er voor dat zij sneller zullen proberen om op illegale wijze hun inkomsten te vergroten wat weer leidt tot een verhoogd aantal vermogensmisdrijven (meer criminaliteit).

Figure 16: Details of the costs of low literacy

Figure 17: Bouwstenen voor Digitale Inclusie: Aanbeveling 3

Bouwstenen voor Digitale Inclusie

Senioren willen graag in eigen omgeving en met gelijkgestemden leren. Zij hebben de voorkeur voor een tablet, omdat deze doorgaans gebruiksvriendelijker is dan een computer of laptop. De smartphone is voor hen geschikt als social media instrument.

In toenemende mate wordt bezit van een adequaat mobiel device verondersteld. Zo vragen scholen hun leerlingen steeds vaker om een tablet of computer te gebruiken in de klas en om thuis huiswerk te maken. De school voorziet echter niet altijd in die apparaten. Laptops of andere apparatuur worden daarom voor kinderen vanaf 10 jaar als armoedevoorziening verstrekt. Daarnaast is er een landelijke lobby gaande om computerapparatuur onder de Wet gratis schoolboeken te laten vallen¹⁰, waardoor scholen verplicht zijn om, indien zij in hun lessen gebruik maken van digitaal lesmateriaal, dit ook kosteloos beschikbaar te stellen.

Aanbeveling 2

Om digitaal vaardiger te worden hebben Amsterdammers die in armoede leven de juiste apparatuur nodig. Het is zeer kostbaar om al deze minima door middel van een armoedevoorziening van een apparaat te voorzien. Dit is wellicht ook niet wenselijk gezien de grote diversiteit aan persoonlijke voorkeuren. Daarom wordt voorgesteld om de infrastructurele voorzieningen in de wijk te versterken door relevante ontmoetingslocaties in de buurt (zoals huizen van de wijk) te voorzien van circa 10 laptops, 10 tablets, 2 printers en Wi-Fi, allen van goede kwaliteit en met garantie. Daarbij moet het mogelijk zijn om (persoonlijke) hulp in te schakelen tijdens het gebruik ervan. Uiteraard moet ook worden voorzien in het onderhoud en tijdige vervanging van de apparatuur (iedere 4 jaar). Het betreft naar schatting 50 ontmoetingslocaties. De kosten per locatie worden hiervoor op €12.000¹¹ geschat. Totale kosten zijn daarmee €600.000 per 4 jaar.

Deze apparatuur hoeft echter niet "waardevrij" beschikbaar gesteld te worden. Van mensen kan worden verwacht dat zij een tegenprestatie leveren om er gebruik van te maken. Zo kunnen meer digitaal vaardige minima wellicht minder digitaal vaardigen helpen hun kennis te vergroten. Of een

meer vaardige groep kan instructiefilmpjes maken voor minder vaardige groepen. Een tegenprestatie kan ook bestaan uit een niet-digitaal-gerelateerde dienst zoals medebeheer van de locatie of het betalen van een kleine financiële bijdrage.

Aanbeveling 3

De smartphone is veruit het meest gebruikte apparaat. Investeer in een goede digitale interactie met burgers met lage digitale vaardigheden. Denk bijvoorbeeld aan de inzet van inzet van filmpjes, beslisbomen en chatbots, die allen geschikt zijn voor gebruik op smartphones. Door meer aanbod (websites, systemen etc.) geschikt te maken voor de smartphone en het gebruik te versimpelen met behulp van beslisbomen en visualisaties, kunnen de gebruiksmogelijkheden van smartphones worden vergroot en ontstaat bij de doelgroep vertrouwen om digitale toepassingen te gebruiken. Ervaringen die de gemeente opdoet kunnen worden gedeeld en ter beschikking worden gesteld aan partners. De gemeente kan bijvoorbeeld een startup opdracht geven om bestaand aanbod door te ontwikkelen tot een aantrekkelijk en toegankelijk aanbod dat kan worden gebruikt op de smartphone. Zo kan bestaande kennis worden geborgd, maar wordt ook kennis van buiten gehaald opdat innovatie stappen kunnen worden gezet.



VAARDIGHEDEN

Per 2021 wordt de ontwikkeling van digitale vaardigheden als vast onderdeel opgenomen van het onderwijscurriculum (PO en VO). Daarvoor ontwikkelt het platform Curriculum.nu in samenwerking met de Stichting Leerplan Ontwikkeling (SLO) een adequaat basisprogramma. Dit betekent dat er aan een structurele borging van lesprogramma's op de langere termijn wordt gewerkt, maar dat in de periode daarvoor kinderen achter dreigen te raken omdat zij vanuit huis niet als vanzelfsprekend worden gestimuleerd.

Aanbeveling 4

Investeer op de korte termijn in buitenschools aanbod voor kinderen met als doel hun (basale) digitale basisvaardigheden verder te ontwikkelen. Zo kan worden voorkomen dat kwetsbare kinderen tussen wal en schip vallen in de periode tot 2021.

VO- en MBO-scholen besteden vandaag de dag steeds meer lestijd aan het trainen van digitale vaardigheden aan zowel kinderen als aan leerkrachten. Bedrijven

¹⁰ De lobby wordt gevoerd door ouderorganisatie Ouders en Onderwijs, stichting Leergeld en de VO-raad: <https://nos.nl/artikel/2155380-laptop-vergroot-ongelijkheid-in-het-onderwijs.html>.

¹¹ Uitgaande van een prijs van €500 per laptop en tablet (dit is een indicatie van de kosten gebaseerd op de aanbesteding van de PC-voorzienig). Dit leidt tot de volgende rekensom: 20 (10 tablets en 10 laptops) x €500 + €2.000 voor Wi-Fi en twee printers = €12.000. Het gaat hier om laptops en tablets voorzien van office-programma's, garantie voor 4 jaar en een eenmalige onderhoudsbeurt (APK).

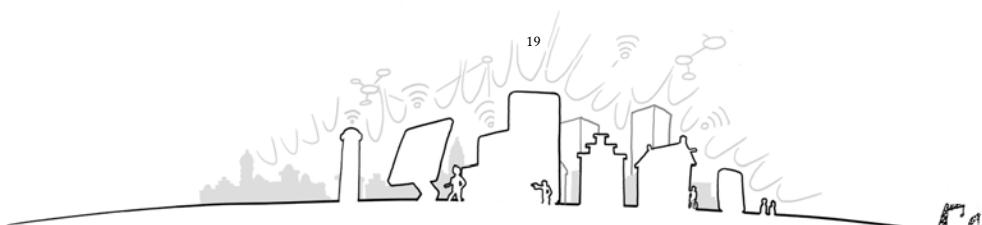


Figure 18: Example letter of Stichting Lezen en Schrijven



Voorbeeldbrief gemeente A2/1F

Ons kenmerk: 10.00100517
Project: afval
Datum: 18 maart 2017

Gemeente Leesdijk

Geachte meneer, mevrouw, beste buurtbewoner,

Deze brief gaat over afval. Het ophalen en verwerken van afval in de gemeente Leesdijk moet namelijk anders. Dat is nodig voor het milieu.

De gemeente werkt daarom aan een nieuw afval-beleid. U kunt ons helpen, door mee te denken. Dit kan tijdens een bijeenkomst op 8 april.

Wat heeft ons afval met het milieu te maken?
Bij het verbranden van ons afval komen er veel vuile stoffen in de lucht. Deze zijn slecht voor het milieu. Doordat er veel van die stoffen in de lucht komen, gaat de temperatuur op aarde omhoog. Hierdoor verandert ons klimaat. Daar gaan we last van krijgen.

Wat kan onze gemeente doen?
De gemeente wil zorgen voor een schone lucht. Dat betekent dat we moeten nadenken over wat er beter kan. Kunnen we bijvoorbeeld meer afval scheiden en meer opnieuw gebruiken? Er hoeft dan minder verbrand te worden. Dan blijft de lucht dus schoner.

Wat vindt u?
De gemeente wil graag dat de inwoners meedenken. Wat vindt u bijvoorbeeld van:
- Hoe kan het afval het beste worden ingezameld?
- Zijn de rol-emmers handig?
- Is het inzamelen van het grofvuil op de gemeentewerf praktisch voor u?
- Kunt u het oud papier goed kwijt?
- Heeft u voorstellen voor de verbetering?

Komt u ook?
Naar wat : Naar de bijeenkomst over een nieuw afval-beleid.
Voor wie : Elke inwoner van de gemeente Leesdijk is van harte welkom.
Wanneer : maandag 8 april
Waar : de raadszaal van het stadhuis in Leesdijk
Hoe laat : van 19:30 tot 21:30 uur

Inhoud : De teamleider afval, mevrouw Vermeern houdt een korte inleiding. Daarna gaat de gemeente met de inwoners in gesprek. De wethouder, meneer Wouterson, is er ook.

Aanmelden: graag vóór maandag 1 april via communicatie@leesdijk.nl.
U kunt ons ook bellen 045 – 234 54 88. Vraag dan naar mevrouw Jansen.

Met vriendelijke groet,
Janneke Vermeern

Teamleider Afval, Gemeente Leesdijk

Figure 19: Writing tips Stichting Lezen en Schrijven



Eenvoudige taal voor laaggeletterden

BEGRIJPPELIJKE TAAL

Steeds meer organisaties schrijven teksten op taalniveau B1. Dit kunnen de meeste mensen goed begrijpen. Maar voor laaggeletterden is een brief of folder op dit niveau te moeilijk. Zij hebben moeite met lezen, schrijven en/of rekenen. Ze beheersen niet het minimale taalniveau om volwaardig aan de Nederlandse maatschappij te kunnen meedoen.

Tips

Het is goed om ervoor te zorgen dat laaggeletterden informatie kunnen begrijpen. Daarom adviseren wij om voor deze doelgroep te schrijven op een lager niveau: A2/1F*. Om het makkelijk te maken om een tekst in eenvoudige taal te schrijven, is er een lijst met tips.

Taalscholing

In Nederland zijn 2,5 miljoen mensen laaggeletterd. Stichting Lezen & Schrijven zet zich in om ervoor te zorgen dat laaggeletterden (taal)scholing kunnen volgen. Dat doen we samen met honderden andere organisaties. Ook het aanbieden van teksten in eenvoudige taal helpt laaggeletterden.

GESCHIKTE ONDERWERPEN

Niet alle onderwerpen zijn te beschrijven in een tekst voor laaggeletterden. Denk aan informatie waarbij veel vaktaal nodig is. Bijvoorbeeld een ingewikkelde medische of juridische procedure. Ook een enquête kan lastig zijn. Een gesprek voeren is dan beter. Geef na het gesprek begrijpelijke informatie op papier mee.



VOORBEELDTEKSTEN

Hieronder staat een alinea uit een brief over afval van een gemeente op twee verschillende niveaus.

Voorbeeld niveau A2/1F:

Wat kan onze gemeente doen?

De gemeente wil zorgen voor een schonere lucht. Dat betekent dat we moeten nadenken over wat er beter kan. Kunnen we bijvoorbeeld meer afval scheiden en meer opnieuw gebruiken? Er hoeft dan minder verbrand te worden. Dan blijft de lucht dus schoner.

Voorbeeld niveau B1/2F:

De gemeente wil bekijken of de huidige manieren van afvalinzameling en -verwerking nog wel voldoende milieuvriendelijk zijn. Kunnen we het misschien slimmer aanpakken, zodat meer afval wordt gescheiden en mogelijk hergebruikt? Om dit te bereiken, werkt de gemeente aan een nieuw afvalbeleidsplan.

Op lezenenschrijven.nl/eenvoudigetaal staan de voorbeeldbrieven in hun geheel. Ook is er een voorbeeldfolder over de bedrijfsarts beschikbaar.

* Voor het niveau van taalbeheersing worden verschillende aanduidingen gehanteerd. Stichting Lezen & Schrijven hanteert deze ook. Voor anderstaligen gebruiken we het Raamwerk NT2 (A1, A2, B1, B2, C1, C2). Voor Nederlandstaligen gebruiken we de Standaarden en eindtermen ve (Instroom, 1F, 2F). Laaggeletterden zitten op niveau A2/1F. Een leerling aan het einde van groep 8 moet niveau 1F beheersen om goed te kunnen overstappen naar het voortgezet onderwijs. Meer over de niveaus en de verschillen tussen het Raamwerk NT2 en de Standaarden en eindtermen ve: lezenenschrijven.nl/eenvoudigetaal.

SCHRIJFTIPS

De lezer

- Bedenk goed voor wie de tekst is bedoeld.
- Bedenk wat je wil bereiken met je tekst. Moet de lezer iets doen of iets weten?
- Bedenk welke vragen de lezer kan hebben over het onderwerp van de tekst. En welke antwoorden de lezer op die vragen kan hebben.
- Zorg ervoor dat de lezer zich serieus genomen voelt. Eenvoudig en helder schrijven wil niet zeggen dat het kinderachtig mag zijn!



Tekststructuur

- Geef duidelijk het onderwerp van de tekst aan: de belangrijkste boodschap bovenaan.
- Werk met een titel en tussenkoppen: zorg dat informatie herkenbaar is geordend.
- Kies voor korte tussenkoppen (maximaal 3 woorden).
- Kies voor tussenkoppen met een duidelijke verwijzing naar de inhoud.
- Houd maximaal 5 alinea's aan.
- Alinea's bestaan uit 2 tot 10 zinnen.
- Het aantal woorden per zin: maximaal 10, liever minder.

Tekstinhoud

- Stel een eenvoudige vraag die aangeeft wat de lezer nodig heeft. Of beantwoord een vraag. Maak het zo persoonlijk mogelijk.
Bijvoorbeeld:
 - Heeft u hulp nodig bij het invullen bij uw belastingformulier?
 - Wilt u uw eigen administratie in mappen leren doen?
 - Heeft u vragen over financiën? Bel dan met Jan van Sociaal Wijkteam Poelenburg.
 - Kunnen wij u helpen met het invullen van uw formulieren?
- Kies een concreet onderwerp dat herkenbaar is voor de lezer. Speel zo mogelijk in op iemands eigen situatie. Mensen herkennen de boodschap dan sneller, omdat ze er al mee bezig zijn.
- Geef alleen informatie die nodig is: wat is echt belangrijk voor de lezer?
- Bied niet te veel nieuwe informatie in één keer aan.
- Herhaal belangrijke informatie.
- Geef contactgegevens duidelijk aan. Liefst met de naam van een persoon en een telefoonnummer om vragen te stellen.

Vorm

- Lettertype: groot en met ruimte, schreefloos (bijvoorbeeld Verdana).
- Lettergrootte: minimaal 12.
- Kleur: zwarte letters op een witte ondergrond. Werken met (verschillende) kleuren leidt onnodig af.
- Belangrijke en/of nieuwe informatie: vetgedrukt.
- Regelafstand: minimaal 1,5.
- Zinnen: onder elkaar en links uitlijnen.

Zinsbouw

- Gebruik zo veel mogelijk de 'vaste' woordvolgorde van het Nederlands: onderwerp-persoonsvorm-lijdend voorwerp.
 - Wel: Hij woont heel graag in Amsterdam.
 - Niet: In Amsterdam woont hij heel graag.
- Schrijf actieve zinnen.
 - Wel: De directeur neemt morgen het besluit.
 - Niet: Het besluit wordt morgen genomen door de directeur.
- Houd de werkwoorden zo veel mogelijk bij elkaar en dicht bij het onderwerp.
 - Wel: Zij nam het besluit gisteren in haar eentje.
 - Niet: Zij heeft gisteren in haar eentje het besluit genomen.
- Maak geen tangconstructies.
 - Wel: De burgemeester komt ook op de informatieavond. Hij vertelt over de nieuwe school. Ook krijgt u een filmpje over de nieuwe school te zien.
 - Niet: Op de informatieavond, waar de burgemeester de bewoners zal toespreken over de nieuwe school, krijgt u ook een filmpje te zien over het nieuwe schoolgebouw.
- Voorkom samengestelde zinnen. Maak er losse zinnen van.
 - Wel: Vanaf 2 jaar kan een kind naar de voorschool.
 - De voorschool is er voor alle kinderen.
 - Niet: De voorschool is er voor kinderen vanaf 2 jaar en is er voor alle kinderen.



Beeld

- Gebruik veel concrete beelden:
 - Gaat het over geld?
Laat dan biljetten en munten zien.
 - Kunnen mensen hulp krijgen bij het wijkteam?
Laat dan een foto van het wijkteam zien.
 - Gaat het om een spreekuur?
Laat dan een klok met de juiste tijd zien.
 - Leg je een route uit?
Laat dan de plattegrond zien.
- Gebruik geen grafieken en stroomdiagrammen. Deze zijn moeilijk te begrijpen.
- Foto's werken beter dan tekeningen.

Woorden

- Gebruik woorden die je ook in een dagelijks gesprek zou gebruiken.
- Gebruik geen vaktaal. Moet je toch een moeilijke term gebruiken? Leg die dan uit in de tekst.
- Gebruik woorden die goed passen binnen de strekking van de tekst en de leefwereld van de lezer.
- Gebruik alleen (zeer) gangbare woorden.
 - Wel: maar, want, als.
 - Niet: daarentegen, immers, indien.
- Voorkom het gebruik van synoniemen. Gebruik bijvoorbeeld alleen 'tiener' en niet 'tiener' en 'puber' door elkaar. Kies een woord.
- Gebruik woorden met een eenduidige betekenis.
- Voorkom leenwoorden met een niet-Nederlandse opbouw, zoals cadeau of management.
- Controleer of alle woorden nodig en duidelijk zijn.
- Voorkom uitdrukkingen en figuurlijk taalgebruik.
 - Wel: Ze is heel erg boos.
 - Niet: Ze kookt van woede.
- Schrijf getallen in cijfers.
 - Wel: 11, 25, 100.
 - Niet: elf, vijftwintig, honderd.
- Let op met afkortingen. Schrijf liever de woorden voluit.

TEKST OMZETTEN NAAR NIVEAU A2/1F

Wilt u een tekst laten omzetten naar niveau A2/1F? Of wilt u leren hoe u dat doet? Kijk bij een van de volgende organisaties. Of zoek op internet naar een organisatie bij u in de buurt.

- bureautaal.nl
- eenvoudigcommuniceren.nl
- lexicon.nl
- simpelschrijven.nl
- stichtingmakkelijklezen.nl
- uvatalen.nl

Tip: kijk ook eens op zoekeenvoudigewoorden.nl van BureauTaal. Hier vindt u een handig overzicht met eenvoudige woorden. U kunt controleren of de woorden die u kiest passend zijn voor laaggeletterden (A2).

ERVARINGSDESKUNDIGEN

Bent u benieuwd of uw communicatiematerialen goed aansluiten op het niveau van laaggeletterden? Informeer dan eens bij Stichting ABC. Hun testpanels van ervaringsdeskundigen (voorheen laaggeletterden) denken graag met u mee. Ga voor meer informatie naar a-b-c.nu.

MEER INFORMATIE

Meer weten over schrijven in eenvoudige taal voor laaggeletterden?
Kijk dan op lezenenschrijven.nl/eenvoudigetaal.
Of neem contact op via **070 - 302 26 60** of info@lezenenschrijven.nl.

STICHTING LEZEN & SCHRIJVEN

'Vroeger had ik schulden, nu heb ik een eigen huis.' 'Doordat ik begrijp wat ik eet, ben ik 30 kilo afgevallen.' Laaggeletterden die beter leren lezen, schrijven, rekenen en omgaan met de computer vergroten hun kans op een zelfstandig, gezond en gelukkig leven. Ze kunnen beter meekomen in de maatschappij.

Stichting Lezen & Schrijven biedt laaggeletterden, samen met honderden gemeenteinstellingen, bedrijven, docenten en vrijwilligers, die kans. Door (taalscholing te organiseren en door laaggeletterdheid onderwerp van gesprek te maken bij publiek en politiek. Deze uitgave is gefinancierd door de Rijksoverheid.

lezenenschrijven.nl

V201701

Figure 20: Factsheet digital skills Stichting Lezen en Schrijven



Digitale vaardigheden en laaggeletterdheid

FEITEN & CIJFERS

- In Nederland heeft 22% van de bevolking van 12 jaar en ouder geen of weinig **ICT-vaardigheden** (CBS, 2016).
- Effectief ICT-gebruik van werknemers is op de **arbeidsmarkt** van groot belang voor de productiviteit van bedrijven (SCP, 2007).
- Veel leerlingen (10 tot 18 jaar) hebben moeite om op internet te zoeken en informatie **online** op waarde te schatten (Kennisnet, 2017).

- 2,5 miljoen volwassenen (18% van de Nederlandse bevolking van 16 jaar en ouder) heeft grote moeite met lezen, schrijven en/of rekenen. Zij zijn laaggeletterd. Vaak hebben zij ook moeite met de **digitale vaardigheden** (Algemene Rekenkamer, 2016).
- Laaggeletterden** beschikken over minder functionele taalvaardigheden en dit is een belangrijke voorwaarde voor de ontwikkeling van digitale vaardigheden (ecbo, 2015).
- Naarmate iemand minder geletterd is, nemen onder andere zijn/haar **informatievaardigheden** af. Moeite hebben met lezen en schrijven heeft dus invloed op het kunnen navigeren en oriënteren op internet (Universiteit Twente, 2010).
- De kans op onvoldoende digitale vaardigheden is ongeveer **drie keer** zo groot bij laaggeletterden (ecbo, 2015).
- Na een cursus **Taal voor het Leven** zijn deelnemers niet alleen beter in lezen (67%) maar ervaren ze zich ook digitaal vaardiger (60%) (De Gref & Segers, 2017).

IEDEREEN MOET ONLINE KUNNEN MEEDOEN

Om goed mee te kunnen doen in de maatschappij moet je voldoende **digitale vaardigheden** hebben. Dat zijn vaardigheden die nodig zijn om te kunnen lezen, schrijven en rekenen op digitale apparaten. Zoals een computer, tablet of smartphone. Of het gebruik van een betaalaanmelder of wasmachine. Daarnaast gaat het over begrip van de digitale wereld, zoals het zoeken en beoordelen van informatie, digitale veiligheid en privacy.

Er bestaat een **groeiende kloof** tussen laaggeletterden en geletterden. Een van de redenen is dat er steeds meer digitale vaardigheden van mensen gevraagd worden. Zo is het steeds gebruikelijker voor de overheid en bedrijven om hun diensten online aan te bieden. Denk bijvoorbeeld aan het gebruik van DigiD en het aanvragen van toeslagen.

Stichting Lezen & Schrijven roept iedereen op – van politiek, gemeenten, bibliotheken tot bedrijven – om **meer** aandacht te geven aan het belang van digitale vaardigheden.

Om een efficiënte aanpak te kunnen ontwikkelen is **meer onderzoek** nodig naar hoeveel van de 2,5 miljoen laaggeletterden ook moeite hebben met digitale vaardigheden.

DIGIMETER

- Met de Digimeter kunnen gemeenten, UWV's en andere organisaties snel in kaart brengen of iemand moeite heeft met digitale vaardigheden.
- De Digimeter is een online instrument en is speciaal ontwikkeld voor mensen met een laag taalniveau.
- Meer informatie is te vinden op basismeters.nl.

(DIGI)TAAL

Stichting Lezen & Schrijven richt zich binnen het programma Taal voor het Leven o.a. op mensen met lage digitale vaardigheden, die ook laaggeletterd zijn. Voor deze doelgroep is het belangrijk dat lesmateriaal en cursussen beschikbaar zijn op een geschikt taalniveau.

Online teksten zijn vaak geschreven op taalniveau 2F/B1. Dit niveau is voor laaggeletterden te moeilijk. Het advies is om voor deze doelgroep teksten te schrijven op niveau 1F/A2. Meer informatie en tips om eenvoudig te schrijven is te vinden op de factsheet 'Eenvoudige taal voor laaggeletterden'.

25 Voorbeeldopdracht uit de Digimeter

WAT ZIJN DE NIVEAUS VAN DIGITALE VAARDIGHEDEN?

In de standaarden en eindtermen volwasseneneducatie zijn de niveaus van taal, rekenen en digitale vaardigheden beschreven. Er zijn drie niveaus beschreven voor digitale vaardigheden: Instroom, Basisniveau 1 en Basisniveau 2. Deze niveaus sluiten aan op de niveaus Instroom, 1F en 2F van taal en rekenen.

Niveaus van voorbeelden van digitale vaardigheden			
Domeinen	Instroom	Basisniveau 1	Basisniveau 2
Taalniveau	Instroom	1F	2F
Het gebruik van ICT-systemen	telefoon of tablet aanzetten en ontgrendelen, een eenvoudige app gebruiken, pinnen	internet opstarten, bestanden opslaan, foto's maken en sturen	meerdere programma's tegelijk gebruiken, een structuur voor bestanden opzetten
Beveiliging, privacy en gezondheid	wachtwoorden geheim houden, veilige website herkennen, computer afsluiten/uiloggen	veilig wachtwoord maken, begrip van risico's en privacy bij digitaal communiceren	profielininstellingen wijzigen op sociale media zodat alleen bekenden informatie zien
Informatie zoeken	webadressen herkennen, contactgegevens opzoeken op een website	een zoekmachine gebruiken op internet, informatie selecteren op een website	verschillende zoektechnieken gebruiken, informatie beoordelen en selecteren
Informatie verwerken	berichtje typen, eenvoudig digitaal formulier invullen, spellingscorrectie herkennen	eenvoudige tekst typen, informatie in een schema zetten, een bijlage toevoegen aan een bericht	standaard lay-out toepassen, bestanden beheren, online iets bestellen
Digitaal communiceren	een bericht ontvangen en beantwoorden, een online profiel kiezen	berichten met tekst, beeld of geluid maken en doorsturen, een eenvoudige presentatie maken	verschillende communicatiemiddelen kunnen gebruiken voor verschillende doeleinden

Meer informatie over de niveaus is te vinden via www.steunpuntbasisvaardigheden.nl.

LESMATERIAAL MET DIGITALE THEMA'S

- Succes! is een lesmethode voor volwassenen die beter willen leren lezen, schrijven en rekenen. Situaties uit het dagelijks leven en de werkomgeving, zoals het regelen van bankzaken, staan hierin centraal. Er is Succes!-materiaal over digitale onderwerpen, zoals 'Kopen op internet' (niveau 1F) en 'Wat doe jij op het internet?' (niveau 2F).
- In het materiaal Werk ze! leren deelnemers hoe ze online vacatures kunnen vinden.
- Op de website evaenik.nl staan oefeningen over 'Werk & solliciteren' en 'Internet & computers'.



"Sinds ik taalles volg, ga ik als een speer. Ik kan bijvoorbeeld sms'jes versturen, de TomTom instellen en dingen opzoeken op internet."

Peter uit
Noord-Brabant

OEFENEN MET DIGITALE VAARDIGHEDEN

Voorbeelden van programma's voor volwassenen met lage basisvaardigheden:

- oefenen.nl
- steffie.nl

TAAL VOOR HET LEVEN

Wilt u samen aan de slag om de digitale kloof te dichten?

Stichting Lezen & Schrijven kan u daarbij helpen.

Het samenwerkingsprogramma Taal voor het Leven biedt gemeenten en organisaties ondersteuning in het opbouwen van een lokale infrastructuur. Zo kunnen we samen zo veel mogelijk mensen vinden en scholen die laaggeletterd zijn en ook moeite hebben met hun digitale vaardigheden. Meer informatie over het programma: taalvoorhetleven.nl.

Neem vrijblijvend contact op met een lokale projectleider via taalvoorhetleven.nl/contact, bel **070 - 302 26 60** of mail naar info@lezenenschrijven.nl.

TAAL MAAKT STERKER

In Nederland hebben 2,5 miljoen volwassenen moeite met lezen, schrijven en/of rekenen. Vaak hebben zij ook moeite met digitale vaardigheden. Dat heeft grote impact op hun persoonlijke leven. Als je niet goed kunt lezen en schrijven, vind je minder snel een baan, kun je minder gezond leven en heb je minder grip op je geldzaken. Taal maakt je dus sterker. Daarom zorgt Stichting Lezen & Schrijven er samen met haar partners voor dat zoveel mogelijk mensen in Nederland kunnen lezen, schrijven, rekenen en digitaal vaardig zijn. Door honderden organisaties te ondersteunen met scholing, onderzoek, (les)materiaal, advies en campagnes. En door laaggeletterdheid onderwerp van gesprek te maken bij publiek en politiek. Want onze samenleving wordt sterker als iedereen kan meedoen. Deze uitgave is gefinancierd door de Rijksoverheid.

lezenenschrijven.nl



Figure 21: UI of the VraagApp

Figure 22: Example letter of the municipality of Amsterdam



Figure 23: Example letter of the municipality of Amsterdam

