

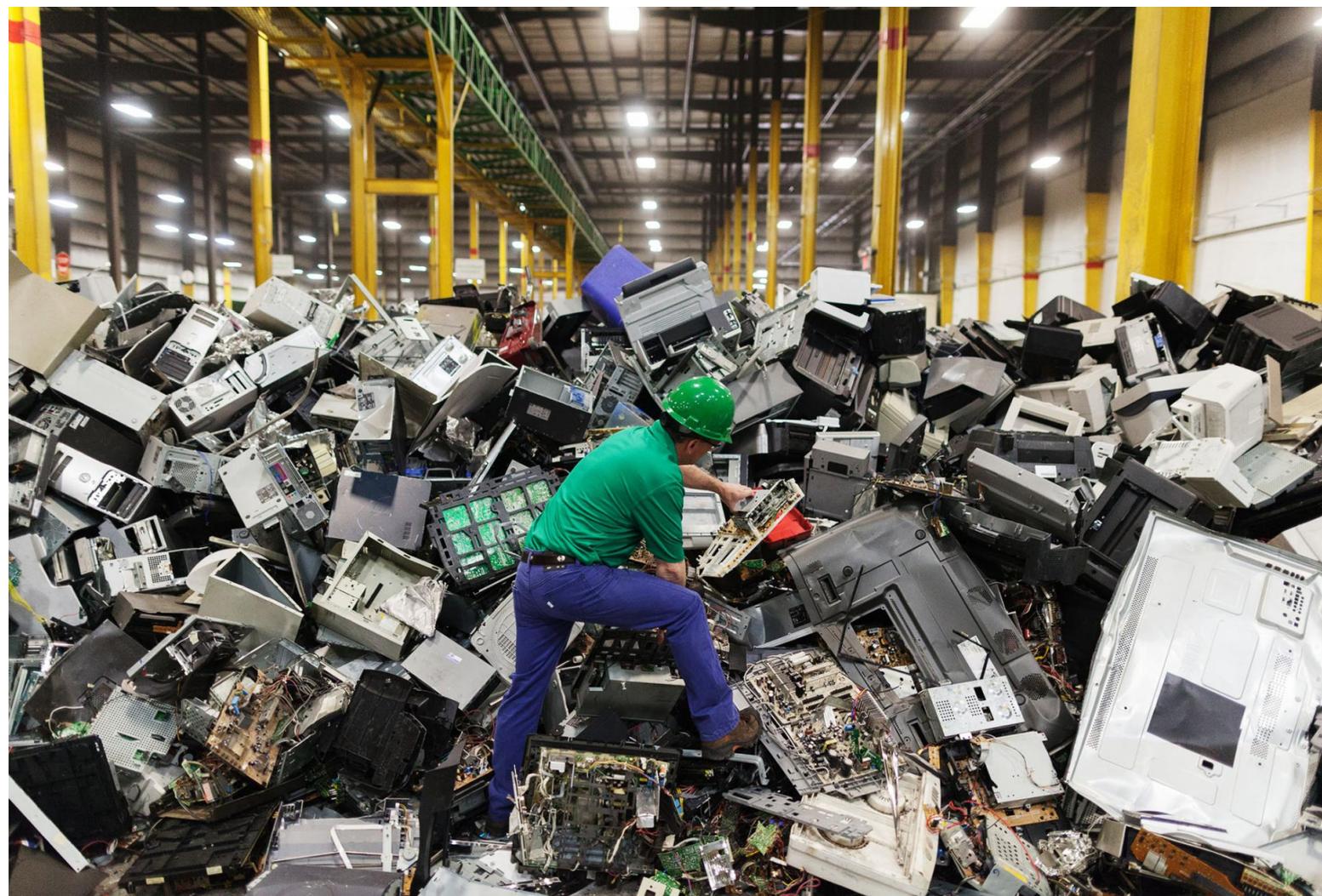


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The growing e-waste mountain: do citizen initiatives decrease it?

A study on how citizen initiatives apply information to increase the recycling rate of young adults in the Netherlands.



Joost van der Wal
Bachelor Thesis Spatial Planning & Design

Colophon

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| Author: | Joost van der Wal j.van.der.wal.13@student.rug.nl |
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Summary

This research investigated the application of information by citizen initiatives to address the willingness of young adults in the Netherlands to recycle small e-waste and the results of their strategy. The central question was how the citizen initiatives apply the information and what the possible outcomes are. This to provide insight into how the e-waste mountain could decrease in the future. To provide insight into how citizen initiatives apply information, interviews with E-waste race/arcade, Stichting Aap, and Recycleplan were conducted. Moreover, to provide insight into the possible outcomes of the information application by citizen initiatives, five individual interviews with young adults were conducted. During the interviews, the informational intervention strategy was important, which includes the norm activation model. The norm activation model displays that more information leads to an increased awareness and finally to increased willingness to recycle. Moreover, theories regarding the effectiveness of citizen initiatives played a key role. Citizen initiatives are considered more effective than the government because they are closer to the citizens and contribute to an increased liveability. However, they also are considered selfish and untransparent.

The most important findings are that applying information increases the awareness of young adults in the Netherlands, but information does not necessarily lead to an increased willingness to recycle small e-waste. Other factors, such as convenience and sustainability play also a role. Moreover, citizen initiatives are closer to the citizens but are also aiming at making money, which could cause selfish decisions. To overcome the issue of making selfish decisions, citizen initiatives could make their strategy and the results of their strategy more transparent.

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1. Introduction

Humanity produces more and more e-waste, while only a limited part is being recycled. Continuous growth of the e-waste mountain is predicted, which increasingly generates problems for the future (Baldé et al., 2017). Environ Monit (2005) addresses the growing e-waste mountain and argues that the increase in electronic consuming and innovation creates the growing e-waste mountain.

Figure 1 illustrates the e-waste mountain. In 2016 the world produced 44,7 million tons of e-waste (Bel et al., 2019:9), which is more than all the commercial aircraft ever produced. It is expected that the e-waste mountain continues to grow to a staggering 120 million tons e-waste per year in 2050 (Bel et al., 2019:9). In the Netherlands, 23,9 kilograms e-waste per capita was produced in 2017. Only 41% of the 23,9 kilograms was recycled (Compendium voor de Leefomgeving, 2019). In comparison to other European countries, the recycling performance is moderate and needs improvement (CBS, 2019:33). The e-waste is dumped, traded, recycled under inferior conditions, or ends up in the household waste (CBS, 2019:33).

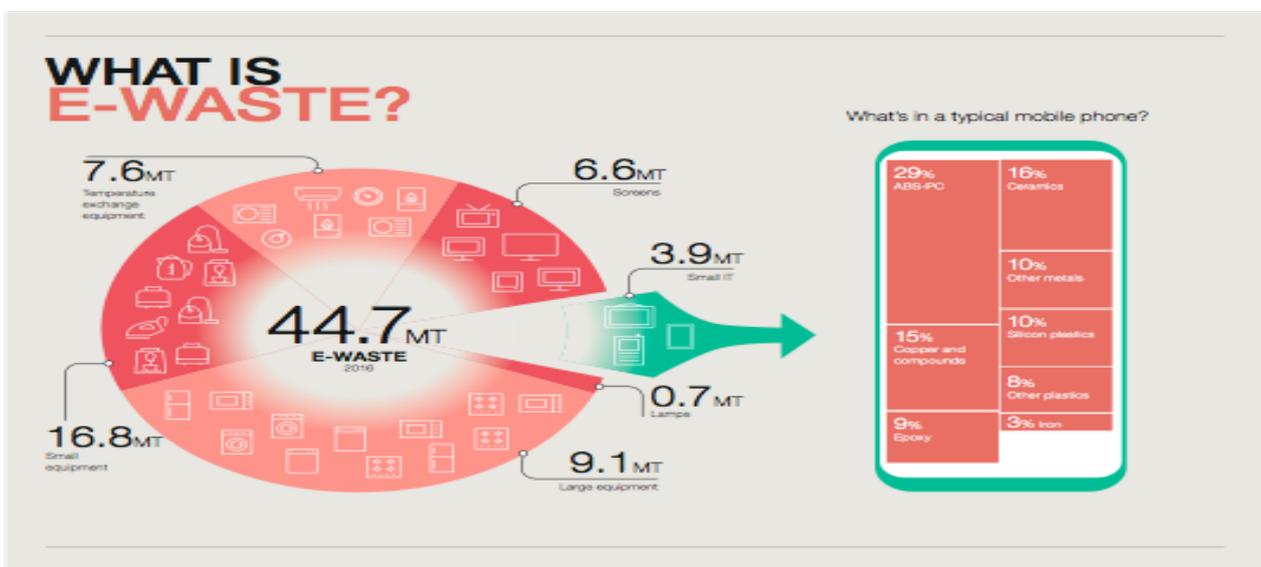


Figure 1: The e-waste mountain illustrated (Bel et al., 2019)

One of the largest problems is small e-waste (Witteveen + Bos, 2017). Figure 1 supports the small e-waste problem, showing that 21,4 million tons was small e-waste in 2018, including small IT equipment and lamps. Moreover, Brenton et al. (2013) explain that older individuals try to avoid environmental harm more than younger generations, which implies that older generations recycle more than younger generations. Older generations recycle more than younger generations because they engage more with nature (Brenton et al., 2013). Citizen initiatives are also aiming at the younger generations, to ensure that the recycling of small e-waste becomes a habit. Furthermore, Delle Selve et al. (2016) state that there is a connection between age and recycling.

To minimize the e-waste mountain, governmental driven initiatives and citizen initiatives are established. Legislation to deal with e-waste is in place in the Netherlands (Bel et al., 2019). To serve the legislation, governmental organizations set up initiatives to collect and recycle e-waste (Witteveen + Bos, 2017). Moreover, citizen initiatives are established by citizens to deal with the growing e-waste mountain. Citizen initiatives are initiatives, which are organized by private

households, and they are initiated independently from the government and the market forces (Silva et al., 2018).

Accordingly, Van der Werff et al. (2019) argue that an informational strategy helps reducing waste. However, Van der Werf et al. (2019) focus on normal household waste and not on specific kinds of wastes, such as e-waste. The informational strategy is connected to citizen initiatives since an important component of the citizens' initiatives strategy is providing information to citizens.

All the articles mentioned form the relevance of this research. Environ Monit (2005) and Baldé et al. (2017) illustrate the importance of finding a solution to the growing e-waste problem. Thereby, Brenton et al. (2013), Delle Selve et al. (2016) and (Bel et al., 2019) illustrate the importance of recycling e-waste and but that recycling rate depends on age. To battle the growing e-waste problem, an informational intervention strategy by citizen initiatives to reduce e-waste could help (Van der Werff et al. 2019). An informational strategy aims to provide people with knowledge on how to recycle but also where they can recycle. With this information applied by citizen initiatives, recycling behavior could change positively (Van der Werff et al., 2019). The focus group is young adults since the recycling rate among young adults is lower than among other population groups (Delle Selve et al., 2016). Furthermore, focussing on small electronic devices is important, because small electronic devices are the most difficult to recycle (Witteveen + Bos, 2017).

1.1 Research problem

The background information leads to the research aim. This research aims to determine how the willingness of young adults in the Netherlands to recycle small e-waste changes when citizen initiatives apply an informational strategy. Moreover, this research aims at determining the current willingness of young adults to recycle small e-waste in the Netherlands and what the possible outcomes of the citizen initiatives informational strategy are to decrease the e-waste mountain. Theories regarding citizen initiatives' effectiveness, the norm activation model, and theories regarding informational strategies form the core of this research.

The research aim leads to the main research question:

How do citizen initiatives apply information to address the willingness of young adults in the Netherlands to recycle small e-waste and what are the possible outcomes of this strategy?

To answer the main research question, the following secondary questions are relevant:

- What informational strategy do citizen initiatives on reducing small e-waste apply to increase the willingness to reduce small e-waste?
- In what way develops the willingness of young adults to recycle small e-waste by applying information?
- In what way should an informational strategy be applied by citizen initiatives to increase the willingness of young adults to recycle small e-waste?

1.2 Thesis structure

To answer the research questions, this thesis follows the following structure. Chapter two defines the theories, which form the basis of this research. Moreover, the scientific relevance is described and the conceptual model is presented. The next chapter elaborates the methodology, including ethical considerations. The interview outcomes and therefore the research results are presented in chapter four. Chapter four contains the results and compares the results with the theoretical framework. The last chapter contains the conclusion, discussion, and recommendations. At the end of this thesis, a list of references is included. Moreover, 2 attachments are included, which contain the data collection instrument.

2. Theoretical framework

2.1 Citizen initiatives to reduce e-waste

The definition of a citizen initiative was important to choose three for interviews. The characteristics of citizen initiatives are, with the help of Silva et al. (2018) and Boonstra (2015), summarized in Table 1.

| Characteristic: | Defined by: |
|--|---------------------|
| Citizen initiatives are issue-oriented. | Boonstra (2015) |
| The projects have an assignable geographical and social origin. | Boonstra (2015) |
| The structure is informal and a specific community interest is served. | Boonstra (2015) |
| Citizen initiatives try to replace the role of companies or the government. | Boonstra (2015) |
| Citizen initiatives are self-organized. | Silva et al. (2018) |
| Citizen initiatives define goals and define how to achieve these goals. | Silva et al. (2018) |
| Citizen initiatives are independent of the government or other external organizations. | Silva et al. (2018) |

Table 1: Definition of citizen initiatives

Citizen initiatives are considered effective because they regularly improve safety, liveability and social cohesion (Silva et al., 2018). Citizen initiatives are considered more effective than governmental initiatives because citizen initiatives lead to social innovation, more sustainable and resilient places, citizens' empowerment, higher quality of life and better citizen-government relations (Silva et al., 2018). Irvin & Stansbury (2004) argue that citizen initiatives gain control in the policymaking process and are better able to achieve certain outcomes. Moreover, citizen initiatives play an important role in education: citizen initiatives can create awareness (Robertson et al., 2018)

Although Silva et al. (2018) describe the advantages of a citizen initiative, Thaler & Seebauer (2019) describe disadvantages. Thaler & Seebauer (2019) argue that conflicts between public administration and citizens could arise. Moreover, citizen initiatives are criticized because they could lack procedural justice (Thaler & Seebauer, 2019). Thaler & Seebauer receive support from Irvin & Stansbury (2004), who argue that citizen initiatives lack authority and could make selfish decisions. Furthermore, citizen initiatives often represent a small part of the population, since they operate in a small area, which makes them less influential than the government (Irvin & Stansbury, 2004). Moreover, citizen initiatives could eventually not achieve their targets, because their orientation on the environmental issue is wrong and their interaction with the government is unsmooth (Zeynep et al., 2017).

2.2 Informational strategy and the norm activation model

According to Van der Werff et al. (2018), informational strategies aim at changing people's perceptions, norms, knowledge, and motivations to promote sustainable waste behavior. As stated in the background, the informational strategy could provide people with knowledge of how, why and where to recycle. With this information, recycling behavior could increase (Van der Werff et al., 2018).

Different types of informational strategies could be distinguished. Van der Werff et al. (2018), provided households information on how and why to recycle with flyers and leaflets, and by visiting people at home and explain the waste issue. Another example is provided by Hansmann & Scholz (2003), who researched if littering behavior was influenced by a two-step informational strategy. This two-step informational strategy contained two pictures, which both informed people about litter. The first picture tried to activate a high motivation to process the information provided by the picture. The second picture ensured that the audience understood the first picture. In the end, the overall result of the two pictures showed to the audience, was a reduction of litter (Hansmann & Scholz, 2003).

Shuyue et al. (2016) provide a different perspective on the informational strategy. Shuyue et al. (2016) describe bringing a revolution for modern agriculture by informing through Internet, big data and e-commerce platforms, which is the informational strategy. The article describes that Internet, big-data and e-commerce platforms have a broad application. However, different ways of applying are possible and it is unclear which way accomplishes the best result.

Comparing the informational strategy of Shuyue et al. (2016) with the strategy of Hansmann & Scholz (2003) and Van der Werff et al. (2018), the strategy of Hansmann & Scholz (2003) can be considered old fashioned, since Shuyue et al. (2016) utilize modern techniques to raise awareness among people concerning community agriculture. Shuyue et al. (2016), Hansmann & Scholz (2003) and Van der Werff et al. (2018) utilize different methods in applying the informational strategy. This underlines that an informational strategy is differently applied. In some cases, the informational strategy achieves a better result than in other cases.

Against Shuyue et al. (2016), Hansmann & Scholz (2003) and Van der Werff et al. (2018), Saari (1990) explains that improving knowledge by providing information is insufficient to change behavior. To generate a successful informational strategy, it is necessary to complement the information with motivational strategies, such as performance feedback (Saari, 1990). Since this research focuses on influencing the willingness to recycle small e-waste by an informational strategy, motivational strategies will not be taken into account. Van der Werff et al. (2018), Hansmann & Scholz (2003) and Shuyue et al. (2016) prove that an informational strategy could work, while Saari (1990) argues that an informational strategy should be supported with motivational strategies. After discussing the application of the informational strategy by Van der Werff et al. (2018), Hansmann & Scholz (2003), Shuyue et al. (2016) and Saari (1990), the application of Van der Werff et al. (2018) is the most suitable for this research, because the research of Van der Werff et al. (2018) was focussed on reducing waste.

The norm activation model forms the basis of the informational strategy. Informational interventions strategies help promote waste minimization because variables of the norm activation model are increased (Van der Werff et al. 2018). It is important to address the functioning of the norm activation model because it explains why an informational intervention strategy possibly works. The informational strategy aims at changing the personal norm since behavior is influenced by personal norms (Han, 2014). When someone feels morally obliged to reduce waste, they probably engage more to do so. A personal norm is influenced by outcome efficacy: the degree to which people think that their behavior helps in reducing the problem. The strength of the outcome efficacy is higher when the awareness of consequences is strong. The degree to which people are aware that waste

causes environmental issues is the awareness of consequences. Figure 2 summarizes the norm activation model.

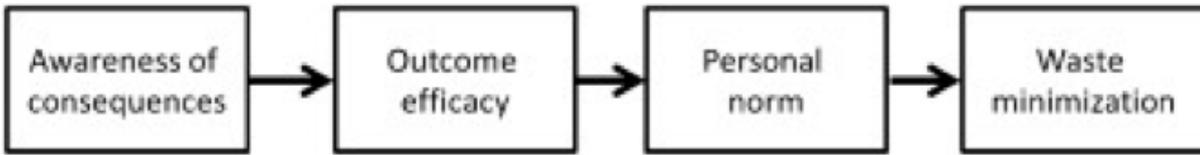


Figure 2: The norm activation model (Han, 2014)

2.3 Conceptual model

Figure 3 represents the conceptual model. The arrows represent a causal relation while lines represent a correlation. The conceptual model represents the relationship between an informational strategy and a citizen initiative. It displays which variables could be utilized for the informational strategy, consisting of, for example, presentations, talking to people, newsletters or photos. The variables in the model are based on the norm activation model (Han, 2014).

The upper box of the model represents the citizen initiatives. The model summarizes the theories discussed in paragraphs 2.1 and 2.2 of this research. The model displays that by applying information, the awareness of consequences increases. The awareness could be influenced by a lack of authority of the citizen initiative or because the initiative is selfish. The most important disadvantages of a citizen initiative is the lack of authority and the selfish decision making, which is why this is included. The changing awareness of consequences could lead to a different outcome efficacy and finally a personal norm. The result could be a changed willingness to recycle small e-waste.

Finally, the changed willingness to recycle small e-waste because of the application of information by citizen initiatives could also influence the willingness to establish a citizen initiative to recycle small e-waste. This is also called the feedback loop.

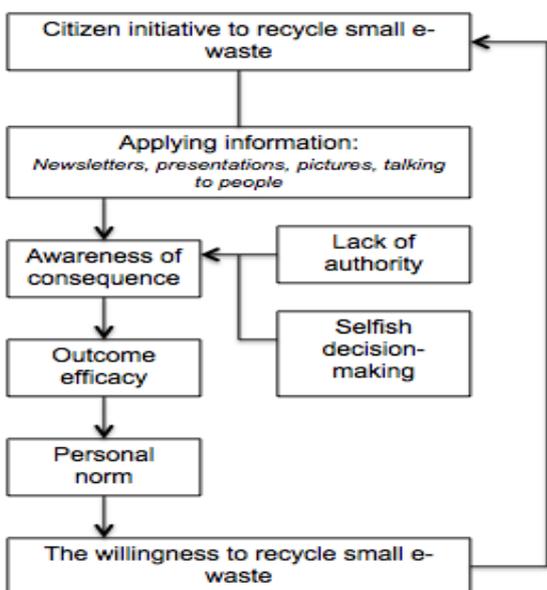


Figure 3: the conceptual model

2.4 Scientific relevance

Researching the application of information by citizen initiatives to address the willingness of young adults to recycle small e-waste is relevant because addressing the willingness of young adults could lead to an increased liveability and a sustainable living environment (Silva et al., 2018). Research in conventional waste recycling is performed regularly; unconventional wastes such as e-waste are underrepresented in those researches (Van der Werff et al., 2018).

This research focuses on the strategy of citizen initiatives to increase the recycling rate of e-waste of young adults by providing information since citizen initiatives try to take over the role of the government. Moreover, with the interviews, this research tries to dissect why citizen initiatives consider themselves more effective than the government. In this way, this research contributes to a clearer view of how citizen initiatives operate and how they try to reduce the e-waste mountain.

3. Methodology

To collect the needed data, interviews with three citizen initiatives and five citizens were conducted. The motivation to select those five citizens and three citizen initiatives is provided in section 3.2. The norm activation model was an important guideline during the interviews. Moreover, during the interviews, the different perspectives on the effectiveness of citizen initiatives were evaluated. The best suitable data collection method for this research was interviews because interviews provide an in-depth insight into the motives to establish citizen initiatives and into why they are (not) effective.

To measure the influence of the informational strategy on recycling small e-waste among young adults in the Netherlands, questionnaires could work (Clifford et al. 2016). Moreover, focus groups were considered, because during a focus group meeting the group talks and discusses a certain topic (Clifford et al. 2016). However, individual interviews were conducted because participants could be influenced by their fellow participants during a focus group. Moreover, interviews provide a better insight into the reasons and motivations for young adults to recycle small e-waste (Clifford et al., 2016).

To measure the effectiveness of citizen initiatives and the application of information by citizen initiatives, three citizen initiatives were selected to interview. Two of the interviews were face to face and one was by phone. The interviews were held with more than one person of the organization when possible, since this provides a consistent view (Clifford et al., 2016).

3.1 Interviews

To collect the required data to answer the main research question, three citizen initiatives were selected. An overview of the selected citizen initiatives is presented in figure 4. Figure 5 illustrates the broad availability of the collection points of Stichting Aap.



Figure 4: Overview of the three citizen initiatives.

To collect the necessary data to answer the main research question, more than three citizen initiatives were approached by sending emails and by calling. However, most of the approached citizen initiatives were not willing to participate, because they were unable to make time. Most of the approached citizen initiatives lacked time because the initiatives are small organizations and therefore the availability of the employees is limited. Beforehand a data collection instrument was developed, which is attached in appendix 1. The interviews were semi-structured: the data collection instrument was leading, but there was also room for other questions. One of the main difficulties was reaching out to the right person. Furthermore, during the interviews the interviewees presented results, but there were no reports available to support these results.

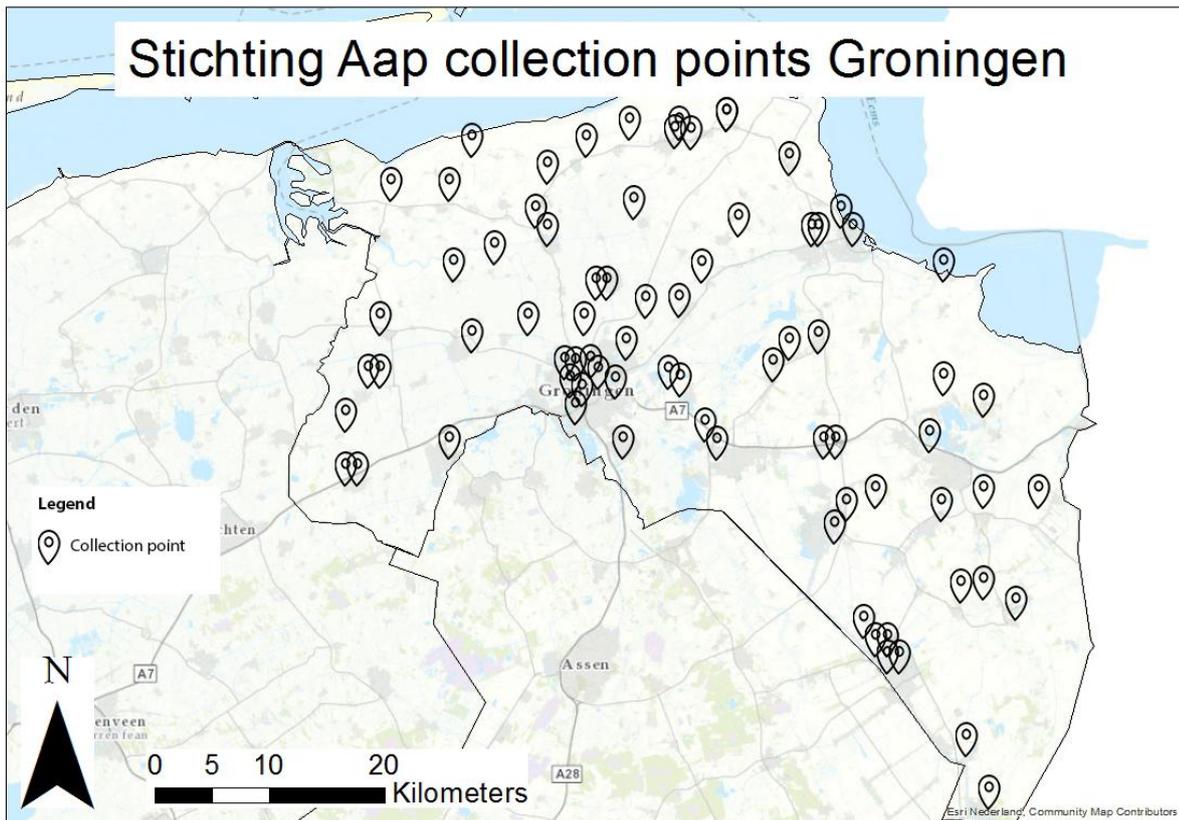


Figure 5: Stichting Aap collection points in the province of Groningen

Consequently, five face-to-face interviews with individuals were conducted. The five individuals were citizens who participated in one of the citizen initiatives. One of them participated in Recycleplan Groningen, three in the Stichting Aap initiative and one in the E-waste race/arcade. It was difficult to find individuals who participated in one of the citizen initiatives because the citizen initiatives were not allowed to provide information on their participants. The five individuals were aged between 18 and 22. Three of them were women and two men. The five individuals studied at the University or an applied University and were from either Meppel or Groningen in the Netherlands. The data collection instrument for the interviews with the five citizens is attached in appendix 2.

3.2 Interviews analysis

All interviews were recorded and afterwards transcribed. After transcribing, the transcriptions were labeled and coded by using different colors for different themes. The transcriptions were labeled and

coded to connect the different interviews. The data collection instrument, attached in appendix 1 and 2, display that the interviews with the individuals covered the left part of the conceptual model and the feedback loop from the willingness to recycle small e-waste to citizen initiatives to recycle small e-waste. The interviews with the citizen initiatives cover the upper- and the right part of the conceptual model.

The main constraint from the collected data is the limited number of participants during the interviews with the citizen initiatives, which is explained by the small size of the organizations. Subsequently, the collected data from the citizen initiatives is one-sided. Moreover, as already stated, numerous citizen initiatives were unwilling to participate.

The main constraint from the collected data with the individuals is the limited time for this research since five interviews provide sufficient insight into the motivations, but five is too little to make regular statements. Furthermore, the interview with E-waste race/arcade was by phone, which makes it difficult to have an in-depth interview.

3.3 Ethical considerations

Since interviews are conducted, ethics play a role. It is important to inform the interviewees about the consequences of this research. Moreover, before the interviews started, the interviewees had to be aware of the recording and agree with the recording. Before the start of the interview, the interviewee signed a permission form for recording and the consequences of this research were indicated. During the research, there were no problems with power relations and the researcher was not personally involved in any of the citizen initiatives.

4. Information application by citizen initiatives and their effectiveness

4.1 Background of the citizen initiatives

To analyze the three citizen initiatives' working method some background information, supplementing chapter three, is provided. Recycleplan is a small organization, operating on a small scale, and managed by the two founders. One employee supports the two founders. By collecting e-waste, the two founders and the employee earn money. Recycleplan was established because one of the founders read a shocking article, which exposed the e-waste problem. Recycleplan collects especially small e-waste and offers it to a recycler. To create awareness, Recycleplan provides presentations to companies regarding recycling e-waste. Moreover, Recycleplan collects e-waste by actively providing bags to households, which they can hand in for recycling. Recycleplan is based in Groningen.

Stichting Aap was established in 1972 and provides shelter to exotic animals. In 2017 54.677 donors donated money to Stichting Aap. Collecting small e-waste is an important income source since Stichting Aap collected €804.240 with their small e-waste collection points in 2018. This is around 11% of their total income (Stichting Aap, 2018:13). The e-waste collection point's exterior contains information regarding small e-waste. The exterior of the collection points provide an explanation of the importance of recycling small e-waste. Moreover, Stichting Aap distributes information through their social media accounts to inform citizens about the collection points. To reach young adults, Stichting Aap established collection points at educational institutions.

E-waste race/arcade is a citizen initiative, which was established by one person, who was interested in recycling and shocked about the low recycling rate of e-waste. The E-waste race/arcade is an initiative, which provides presentations to primary school pupils. After providing presentations, the children start to collecting e-waste together with other schools. The winning school, the one that collected most e-waste, wins and receives a prize. To reach the older generations, such as the young adults, E-waste race/arcade recycles the collected e-waste into arcade cabinets. To play a game, people have to insert small e-waste. The arcade cabinets are present at universities.

4.2 Willingness to recycle small e-waste without information

It is crucial to measure the awareness of what e-waste is, since the interviewees should be aware of the right definition to distinguish e-waste from other waste. Baldé et al. (2017) define small e-waste as all electronic equipment that is disposed, without any intention to re-use it. Small e-waste includes small electronic equipment, lamps and small IT equipment. Batteries are excluded (Baldé et al., 2017).

Three out of five interviewees considered batteries as small e-waste, one interviewee could not define small e-waste and only one person defined small e-waste in the right way. The unawareness of small e-waste is illustrated by Borthakur & Govind (2017), who argues that only a small part of the world population is aware of small e-waste. To reduce the e-waste mountain, it is crucial that the population is aware of e-waste (Borthakur & Govind, 2017). The five individual interview results also present why the recycling rate of small e-waste among young adults is low.

The interviewees could all mention the appropriate recycling manor. Still, they denied utilizing re appropriate recycling way. Also, two of the interviewees kept their broken smartphones. Borthakur & Govind (2017) explain that keeping e-waste is a global problem. 70-75% of global citizens keep e-waste. To explain why the interviewees denied recycling small e-waste in the right way or kept e-waste at home, identifying factors contributing to recycling behavior is crucial. Table 2 displays the factors contributing to certain recycling behavior.

| Factor: | Mentioned by: |
|--|----------------------|
| Too much effort to recycle small e-waste in the right way. (Effort) | 3 interviewees |
| The closest recycling point for small e-waste is too far for me. (Proximity) | 3 interviewees |
| There is too little attention for recycling small e-waste in the right way and therefore I throw it into the residual waste. (Attention) | 2 interviewees |
| It is annoying to bring the small e-waste with me to, for example, a supermarket. (Annoyance) | 1 interviewee |
| It is a habit to throw small e-waste into the residual waste bin. | 1 interviewee |

Table 2: Factors that determine the recycling behavior for the interviewees.

Table 2 shows that to increase the willingness of young adults to recycle small e-waste, those factors should be solved. The factors should be solved because those factors are causing the five young adults to refuse to recycle small e-waste properly. All interviewees confirmed that the current willingness to recycle small e-waste is low. The willingness to recycle small e-waste could increase when recycling would deliver time and money. Recycleplan, E-waste race/arcade and Stichting aap respond to the current willingness of young adults in the Netherlands to recycle small e-waste with their strategy.

Recycleplan, E-waste race/arcade and Stichting Aap all admitted that it is crucial to provide information to increase the awareness of small e-waste and then hopefully increase the willingness of young adults to recycle small e-waste. To create awareness, Recycleplan and E-waste race/arcade apply the same informational strategy: giving presentations. Recycleplan and E-waste race/arcade apply the norm activation model by Han (2014). By applying information, the citizen initiatives try to increase the awareness to change the young adults personal norm. Finally, this changed personal norm should lead to an increased willingness to recycle small e-waste. However, applying information is not sufficient. This contradicts the theory by Van der Werff et al. (2018). Recycleplan agrees with Saari (1990) that, to increase the willingness, intrinsic motivations should grow. To address the intrinsic motivation, Recycleplan and E-waste race/arcade apply a reward system. Furthermore, to increase the recycling rate of small e-waste among young adults, recycling small e-waste should be better accessible. E-waste race/arcade and Recycleplan increase the accessibility by collecting at schools, universities, and companies. For example, E-waste race/arcade reach young adults by placing their arcade at universities. Recycleplan, E-waste race/arcade and Stichting Aap admit the difficulty to reach the young adults and that they have not found the right strategy yet to reach this target audience. Recycleplan and E-waste arcade explain the low willingness of young adults to recycle small e-waste due to the lack of information and low convenience.

Stichting Aap applies a different informational strategy: their collection points provide short information and with social media and their website, they try to reach the young adults. However, Stichting Aap confirms the difficulty of reaching young adults.

The information content is crucial according to Recycleplan and E-waste race/arcade. Both apply the same strategy: showing the consequences of throwing small e-waste into the residual waste bin to increase awareness and willingness. According to them, it is important to emphasize the ease of recycling small e-waste.

4.3 Citizen initiatives' effectiveness

By giving presentations, the initiatives aim at increasing the awareness of consequences. This would lead to a changed personal norm and therefore waste minimization. To measure the working of the norm activation model (Han, 2014), Stichting Aap and E-waste race/arcade showed, during the interviews, the results of their information strategy. The E-waste race/arcade collects 15 tons of e-waste for 4 weeks. Stichting Aap collected €804.240 with their collection points for small e-waste in 2018 (Stichting Aap, 2018:13). Recycleplan is unable to recall results. However, placing the results of E-waste race/arcade and Stichting Aap in perspective is impossible. It is impossible to place the results in perspective because afterward studies were not conducted. For example, E-waste race/arcade do not investigate how much young adults recycle after they participated in their initiative. E-waste race/arcade confirmed that there is a significant difference in the recycling rate between people who participated in their initiative and who did not participate. However, verifying this statement is impossible, since these results are not public.

Furthermore, the citizen initiatives utilize the recycling facilities of other companies, meaning they are not self-contained. The citizen initiatives are forced to cooperate with external parties since this is cheaper. The citizen initiatives want to create a livable world, but they also want to make a profit, which could lead to selfish actions. For example, providing a presentation to a school instead of a company produces a lower yield. Therefore, Recycleplan started to give presentations at companies, because this produces more money. This strategy could finally deviate from the purpose of the initiative, which could cause missing the targets (Zeynep et al., 2017). Changing the strategy might not be the proper way to increase to overall recycling rate and therefore this decision could afterwards be considered as selfish. This confirms the theory of Irvin & Stansbury (2004) that citizen initiatives could make selfish decisions.

The lack of authority is not confirmed by the citizen initiatives, but also not disconfirmed. The three citizen initiatives admit that their initiatives are not sufficient. The government is still needed because the government facilitates the recycling. Furthermore, Recycleplan and E-waste race/arcade admit that the government plays an important role because the government asks the citizen initiatives to help in increasing the recycling rate. Therefore, Recycleplan and E-waste race/arcade think that their authority is inferior to the government and thus confirm that they sometimes lack authority (Thaler & Seebauer, 2019). To sum up, the interviews with Recycleplan, Stichting Aap and E-waste race/arcade show that there is an interaction between citizen initiatives and the government. The government needs the citizen initiatives to increase the recycling rate of young adults. The citizen initiatives also need the government to create support. Therefore, Recycleplan, E-waste race/arcade and Stichting Aap do not encounter conflicts between the public administrations because they cooperate (Thaler & Seebauer, 2019).

Recycleplan, Stichting Aap, and E-waste race/arcade also display the effectiveness of citizen initiatives. They confirm that they are closer to the citizens, which creates more support and in the end better citizen-government relations (Silva et al., 2018). The initiatives are closer to the citizens because they are small organizations and able to reach the citizens informally. The citizen initiatives offer the complete package regarding e-waste recycling, while the government lacks this complete package. By offering a complete package, the citizen initiatives achieve the outcome of a higher recycling rate of small e-waste (Irvin & Stansbury, 2004).

The citizen initiatives confirm that the accessibility is better compared to the government because citizen initiatives are closer to the citizens. Therefore, Recycleplan, Stichting Aap and E-waste race/arcade confirm the view of Silva et al. (2018). The attitude of citizens towards the initiatives is positive because the citizen initiatives can show the relevance of recycling small e-waste. Moreover, Recycleplan and E-waste race/arcade notice that young adults are activated by their initiatives because they bring convenience.

4.4 Attitude of young adults towards citizen initiatives

The interviewees considered citizen initiatives more effective than the government because they are more accessible, it feels less obligatory and the social pressure is higher because citizen initiatives are closely related. This result confirms the view of Silva et al. (2018), who argue that citizen initiatives improve social cohesion. However, the other factors mentioned in section 2.2 why a citizen initiative is considered more effective than the government, were not mentioned.

The interviewees considered citizen initiatives fuzzy, not binding and unreliable. Thaler & Seebauer (2019) argued that citizen initiatives lack procedural justice, which is confirmed by the interviewees, who consider citizen initiatives as not binding. The interview results from the interviews with the five individuals imply that the participants consider citizen initiatives less effective than the government. They consider the citizen initiatives less effective because they are unable to impose recycling small e-waste. Moreover, sometimes the effectiveness of the initiative is less important. Convenience seems to play a substantial role when choosing to recycle through a citizen initiative or the government.

During the interviews, the awareness of citizen initiatives on recycling small e-waste was measured, which is presented in Table 3.

| Sort of citizen initiative | Mentioned by: |
|---|----------------|
| The interviewee cannot mention any citizen initiative | 2 interviewees |
| The interviewee mentions Stichting Aap | 2 interviewees |
| The interviewee mentions Recycleplan | 0 interviewees |
| The interviewee mentions E-waste race/arcade | 0 interviewees |
| The interviewee mentions another initiative | 1 interviewee |

Table 3: Awareness of citizen initiatives

Table 3 shows that, even though the interviewees participated in one of the initiatives, only two interviewees could mention one of the initiatives. Moreover, schools were mentioned twice as a possible citizen initiative, which presents an ignorance of what a citizen initiative is. During the

interviews information was presented to the interviewees by using the information strategies of the citizen initiatives. The information increased the awareness of all five participants. However, only two interviewees confirmed that the increased awareness would lead, under the condition of proper information application, to a changed personal norm and therefore an increased willingness to recycle small e-waste.

Three interviewees disconfirmed that the increased awareness would positively change their norm and therefore the willingness to recycle small e-waste. To change the willingness to recycle small e-waste, the interviewees desired convenience. There is no pressure to change their habit since information only creates awareness and therefore will not lead to an increased willingness to recycle small e-waste.

This result partially confirms the informational strategy presented in section 2.3. Saari (1990) explained that to change behavior, providing information is not sufficient since people need feedback. However, the two interviewees who confirmed that their willingness to recycle small e-waste increased by providing information, confirms the view of Hansmann & Scholz (2003) and Van der Werff et al. (2018) that information leads to an increased willingness to recycle small e-waste. The norm activation model (Han, 2014) is confirmed by two interviewees and denied by three. All five interviewees confirmed an increased awareness of the consequences when recycling small e-waste incorrectly. However, only two confirmed that this would lead to waste minimization.

4.5 The best way to apply information

During the interviews with the individuals, three individuals disconfirmed that information would lead to increased awareness and therefore an increased willingness to recycle small e-waste. However, Recycleplan and E-waste race/arcade confirm that information leads to an increased willingness to recycle small e-waste, which is contradicting the individual interviews.

Recycleplan and E-waste race/arcade explained that giving presentations, in which the consequences of not recycling small e-waste are emphasized, increase the awareness and therefore the willingness. However, the individuals admitted that information is not the only factor: convenience and sustainability also play a role. Therefore, to increase the willingness of young adults to recycle small e-waste, citizen initiatives should continue to inform to increase the awareness with presentations. Moreover, it seems the information should also include how you can conveniently recycle small e-waste and the citizen initiatives should address the intrinsic motivation.

The citizen initiatives utilize information to provide information on how to recycle small e-waste. It seems that the best way of applying information is by using it as instruction. Using information as instruction seems the best way of applying information because young adults seem to need more than just information: they also need convenience.

5. Conclusion and discussion

The individuals considered the citizen initiatives more effective than the government because they are more accessible, less obligatory and social pressure is higher. However, the application of information by the citizen initiatives did not lead necessarily to an increased willingness to recycle small e-waste. The awareness increased, but to increase the willingness, other factors such as convenience should change. This contradicts the view of Van der Werff et al (2018), who argues that a changed awareness leads to an increased willingness.

Citizen initiatives consider it crucial to provide information. Recycleplan and E-waste race/arcade provide presentations in which they address the consequences of not recycling. Moreover, the citizen initiatives confirmed that to reach young adults, applying information is not sufficient. Recycling small e-waste should be more convenient, but it is hard to reach young adults. By applying information, citizen initiatives create awareness, which confirms the view of Robertson et al. (2018). Furthermore, the usefulness of applying information is difficult to measure. The citizen initiatives are broader supported, which supports Irvins & Stansbury (2014). At the same time citizen initiatives are non-transparent and make selfish decisions, supporting the view of Thaler & Seebauer (2019).

The information strategy applied by the citizen initiatives is providing information by giving presentations. However, showing the consequences of not recycling seems not sufficient to change the recycling behavior of young adults. Applying information seems sufficient when it comes to introducing the e-waste topic to young adults. Therefore applying information should be used as instruction tool.

With the results presented in chapter four and five and with the help of the theoretical framework, the main research question can be answered. Recycleplan and E-waste race/arcade apply information by giving presentations, which show the consequences of not recycling, at schools, universities, and companies.. Their informational strategy aims at increasing the awareness of the consequences and therefore aims at increasing the willingness to recycle small e-waste. However, the norm activation model by Han (2014) is rejected, since the interviews with individuals show that more factors than information play a role. By applying information, the citizen initiatives increase the liveability and create awareness, however, they are also non-transparent, do not measure the results of their strategy and could make selfish decisions since they aim at making money. To conclude, the citizen initiatives give presentations and establish their collection point to address the willingness of young adults in the Netherlands to recycle small e-waste. However, the outcome of this strategy is not necessarily an increase in the willingness, because other factors play a role, such as convenience. The application of information by citizen initiatives increase the awareness of consequences, but other factors such as sustainability and convenience also contribute to an increased willingness to recycle small e-waste. Selfish decision-making and a lack of authority seem to play a role for citizens. However, the interview results show that the citizen initiatives are unaware of this issue, which therefore contradicts the view of the interviewed young adults.

The important strength of this research is the qualitative analysis of the citizen initiatives and why they are considered effective or not. Moreover, the motivations to participate in recycling small e-waste by young adults are clarified.

Since this was qualitative research, statements considering the willingness of young adults to recycle small e-waste were difficult to measure. To measure the willingness of young adults on a large scale, questionnaires could be better suitable. Furthermore, some citizen initiatives were not willing to cooperate in an interview. Therefore, the best suitable citizen initiatives were sometimes unavailable.

To measure the willingness of young adults through citizen initiatives, questionnaires should be distributed. Therefore, the first recommendation could be researching the current and the possible willingness of young adults in the Netherlands to recycle small e-waste with a questionnaire. This is important because a questionnaire will provide a better insight into the results of an informational strategy. Another recommendation could be researching the results of the citizen initiatives. As stated in chapter four, citizen initiatives do not measure their results, which is a weakness.

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Appendix 1: Data collection instrument citizen initiatives

This appendix contains the data collection instrument for the interviews with Recycleplan, E-waste Arcade and Stichting Aap. The questions are in English, but were asked in Dutch.

Topic 1: The goal of the organisation

Can you explain the goal of the organisation regarding recycling e-waste?

With what strategy tries the organisation to achieve the goal?

What is the result of the strategy? Are there numbers available which underlines that the strategy works?

What difference do you see between recycling small e-waste and larger e-waste, such as laundry machines?

How does the organisation inform the citizens about their organisation?

So how do you stimulate recycling small e-waste?

How do you reach people from the age 18-24?

Topic 2: Attitude towards citizen initiatives/governmental organisation

How does this organisation look at citizen governmental organisations on reducing e-waste?

What do you think works better in collecting e-waste? A governmental initiative or a citizen initiative and why?

Topic 3: Increasing the e-waste recycling rate

Here I will explain what the influence of providing information (the informational strategy) to citizens on the consequences of not recycling small e-waste could be and in what way you could provide information.

What is your opinion about informing citizens about recycling small e-waste through modern techniques, such as advertisements on facebook?

What is your opinion about informing citizens about recycling small e-waste through commercials with pictures of e-waste?

What is your opinion about informing citizens about recycling small e-waste through informational congresses?

Which of the three named informational strategies do you think could work the best?

What is your attitude towards providing information regarding recycling e-waste to citizens?

Do you think it is helpful?

Do you think there is a different way to increase the recycling rate of small e-waste? And How?

Topic 4: Is the citizen initiative sustainable?

What is the definition of sustainability for you?

What role does sustainability play in your initiative?

Topic 5: The motive to start a citizen initiative?

Why did you start a citizen initiative?

How can others be stimulated to start a citizen initiative?

How do you think that the willingness to recycle small e-waste influences the willingness to establish a citizen initiative?

What is the attitude of citizens about your initiative?

Appendix 2: Data collection instrument individual interviews

This appendix contains the data collection instrument for the interviews with the five individuals. The questions are in English, but were asked in Dutch.

Topic 1: Awareness of small e-waste

Can you explain what small e-waste is?

What do you do with small e-waste? For example, what do you do with your phone when it is broken or what do you do with broken lamps?

Do you know how to recycle e-waste? How?

Topic 2: Willingness to recycle small e-waste through a governmental organisation

What is a governmental organisation?

During the focus group meeting I will shortly explain what a governmental organisation is.

Have you ever recycled small e-waste in the right way? So not throwing it into the normal garbage bin, but bringing it to a special point such as wecycle?

Why are you (not) willing to recycle small e-waste? In which degree are you willing to recycle the small e-waste?

What factors influence your willingness to recycle small e-waste?

Topic 3: Willingness to recycle small e-waste through a citizen initiative with informational intervention.

During the focus group meeting I will first explain what a sustainable citizen initiative such as Recycleplan does. The consequences of not recycling e-waste will be explained with different information sources.

What does the extra information on recycling e-waste do with your awareness of e-waste?

Does it trigger something?

Does the increased or decreased awareness influence your personal norm on recycling e-waste?

Does this also influence your willingness to recycle small e-waste through a citizen initiative?

Topic 4: Other factors

What could also help to increase your willingness to recycle small e-waste except more information?

What kind of information would work the best to increase your willingness to recycle small e-waste through a governmental initiative?