A Policy Aim Analysis of Environmental Awareness Campaigns for Urban Greening in Utrecht;

The potential contribution of ecoliteracy

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Summary

This bachelor thesis analysed the content and aims of environmental awareness campaigns that focus on increasing citizen participation for urban greening as a climate adaptation strategy. The research specifically concentrated on analysing the concept of ecoliteracy, which can be described as the understanding of the interaction between humans and ecology and using this knowledge to create sustainable human societies. There are four key competencies of ecoliteracy: Head, Heart, Hands and Spirit. The thesis therefore aimed to focus specifically on the extent to which these four key competencies of ecoliteracy were present within existing environmental awareness campaigns. The main research question goes as follows: To what extent do existing environmental awareness campaigns contribute to enhancing ecoliteracy among citizens?

Qualitative research methods were used to collect data by analysing grey literature and conducting six semi-structured interviews with stakeholders involved in the design or implementation process of environmental awareness campaigns about urban greening in Utrecht. The results of the research imply that all analysed campaigns, six in total, included two or more competencies as their main objective and that the active and connectional competencies have been present the most. The research outcomes therefore imply that all analysed environmental awareness campaigns in Utrecht contribute to enhancing ecoliteracy to a certain extent.

These results have multiple implications for society and the academic world. The outcomes of this research might be used to increase the effectiveness of future environmental awareness campaigns for urban greening. This is also positive for the broader field of sustainability, as urban areas become more climate adaptive when more bottom-up initiatives for urban greening take place. Furthermore, the results implicate that the Head and Heart competencies are considered as less relevant by policymakers for raising environmental awareness, as they are less often present within the campaigns than the Hands and Spirit competencies. The thesis suggests some recommendations for future research to elaborate more on the need for the presence of all ecoliteracy competencies and to evaluate the actual goal attainment of environmental awareness campaigns in practice.

Introduction

Both the natural environment as well as urban areas have been affected by climate change in the past years, and this will continue to aggravate in the near future (Kabisch et al., 2016). The effects of climate change include extreme weather events, such as extreme precipitation and long periods of drought (IPCC, 2013). Furthermore, urban environments with dense populations and little green areas specifically, will experience an increase in extremely high temperatures during summer (heat stress) and an incapability of storing precipitation (flooding) (IPCC, 2013). Therefore, there is an urgent need for urban areas to adapt to these new weather circumstances caused by climate change (Kabisch et al., 2016). One way to achieve this is by implementing climate adaptation strategies in the form of urban greening projects (Dorst et al., 2019). This research sees urban greening not only as a climate adaptation strategy but as a nature based solution as well. Urban greening is therefore in its core a multifunctional policy strategy (Dorst et al., 2019). Urban greening is not merely an effective method for climate adaptation (Bowler et al., 2010), as a nature based solution it also contributes to increasing biodiversity (Dorst et al., 2019) and the health and wellbeing of urban citizens (Tzoulas et al., 2007).

The societal problem that this study aims to address is the unpreparedness of urban areas for the future, whilst the effects of climate change are becoming more and more visible and pressing (IPCC, 2013). In order to implement effective urban greening policies and to realise better climate adaptation, both actions from (local) governments, businesses and citizens are needed. This research chose to focus on the bottom-up approaches for urban greening by citizens specifically for three reasons. Firstly, including all involved stakeholders in the policy process is an important principle of good governance, this includes active citizen participation as well (Lockwood, 2010). Lockwood states that designing and implementing good governance principles supports the increasing effectiveness of policies, this is a potentially interesting policy design to focus on. The inclusiveness of all involved stakeholders during the policy process is described as one of the seven key principles of good governance (Lockwood, 2010). Well-governed policies ask therefore for a combination of bottom-up and top down efforts. Secondly, Buijs et al. (2019) discuss the potential of mosaic governance for effective urban green infrastructure policymaking specifically. Mosaic governance especially includes active citizen participation as an indicator for effective policymaking around urban green infrastructure, but also mentions the importance of a combination of top-down and bottom-up approaches (Buijs et al., 2019). Thirdly, from a more practical standpoint, the need for citizens to participate in urban greening is also clear, as a large part of cities' surfaces exist of private properties. Besides the fact that active citizen participation contributes to good and mosaic governance opportunities, citizens are thus actually needed in order to make urban areas climate-adaptive.

This research builds on the assumption that fomenting active citizen participation for urban greening may possibly be achieved by enhancing the environmental awareness of citizens (Iizuka, 2016), as environmental awareness includes the adaptation of sustainable behaviour (Zsóka, 2008). An environmental awareness campaign is an excellent example of an instrument that contributes to increasing awareness and therefore tackling current environmental problems concerning the negative effects of climate change on urban areas (Scholtz et al., 2016).

When analysing the content of environmental awareness campaigns for urban greening, this research focusses especially on the concept of ecoliteracy. Ecoliteracy can be described as the understanding of the interaction between humans and ecology and using this knowledge to create sustainable human societies (McBride et al., 2013). Capra (1997) describes four main competencies of ecoliteracy - Head, Heart, Hands and Spirit - that will serve as indicators during this research for the extent to which ecoliteracy is present in awareness campaigns. The choice to focus specifically on the concept of ecoliteracy is motivated by its contribution to enhancing environmental awareness (McBride et al., 2013). The concept has been applied in existing academic literature by multiple

scientists studying its content and potential in (in)formal ways of environmental education (Pilgrim et al., 2007) and in adapting sustainable behaviour (Zainudin, 2013). However, ecoliteracy has not yet been researched a lot as a guiding principle for designing environmental awareness campaigns or environmental education policies in practice (Hammond & Herron, 2012), as suggested by the dearth of scientific literature on this topic**.**

The outcomes of this research show the potential contribution of ecoliteracy in designing environmental awareness campaigns, by analysing the extent to which these campaigns include aspects of ecoliteracy. This knowledge may be used when designing, evaluating and implementing environmental awareness campaigns in the future and to increase their effectiveness. In the long term, the thesis results may contribute to the broader field of sustainability, as urban areas might become more climate adaptive because of an increased extent of sustainable behaviour and active citizen participation for urban greening. Therefore, the societal relevance of this study concerns new insights about the potential contribution of ecoliteracy to the effectiveness of awareness campaigns in stimulating environmental awareness and bottom-up urban greening.

Currently, not much has been written about this thesis subject within scientific literature. This research may bridge the scientific gap between raising environmental awareness in practice and theoretical ecoliteracy. The scientific relevance of this study includes gathering insights about whether all four main principles of ecoliteracy, as described in existing academic literature by Capra (1997), are also present in existing campaigns and even necessary to enhance environmental awareness in practice. Therefore, this thesis serves as an external validity check by critically reflecting on how theoretical insights about ecoliteracy are reflected in practice.

The main research question that this thesis aims to answer is*: To what extent do existing environmental awareness campaigns contribute to enhancing ecoliteracy among citizens?* The main research question will be answered with the help of multiple empirical sub questions:

1) Which awareness campaigns are conducted by municipalities and other organisations linked to the municipality?
2) To what extent do stakeholders (sub)consciously use the principles of ecoliteracy when designing and/or implementing awareness campaigns?

The research question and sub questions will be studied in the case of Utrecht, the Netherlands. In short, this study analyses the extent to which the four key competencies of ecoliteracy are included as main objectives within existing campaigns that have the aim to increase environmental awareness about urban greening among citizens. By doing so, this research seeks to gain more insights about the way stakeholders are (sub)consciously using principles of ecoliteracy in current environmental awareness campaigns. The thesis focusses particularly on the content and aims of the awareness campaigns and whether they have included one or more of the main principles of ecoliteracy as an objective. Therefore, there is little focus on the actual effects of the campaigns in practice.

Theory and concepts

This theory section elaborates on previous environmental scientific research relevant to the research questions. To create an overview of previous literature about the topic of this thesis, key concepts are identified and presented in a conceptual framework. The key concepts of this research include environmental awareness, environmental education, ecoliteracy and awareness campaigns.

Environmental awareness

Raising environmental awareness can be seen as one of the principal goals of environmental education (McBride et al., 2013). Environmental awareness includes the understanding of the multiple different values of the environment for both human society and nature as a whole (Zsóka, 2008). Furthermore, this environmental knowledge should lead to a more environmental-friendly attitude, which includes

a willingness to adopt sustainable behaviour (Zsóka, 2008; Scholtz et al., 2016). Raising environmental awareness can be seen as a form of environmental education, as this includes the aim to inform individuals about environmental issues (Scholtz et al., 2016). The aims of environmental education in general, as described by UNESCO, therefore apply to the content and aims of environmental awareness campaigns as well. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has set three principal goals for environmental education during the Intergovernmental Conference on Environmental Education in 1977 in Tbilisi, that still apply to this day (Locke et al., 2013). In the Tbilisi Declaration, UNESCO stated that environmental education aims "(..)(1) to foster a clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas; (2) to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment; and (3) to create new patterns of behaviour of individuals, groups, and society as a whole towards the environment." (UNESCO, 1978). Furthermore, UNESCO included (environmental) awareness in its description of the five major components of environmental education. The other four major components of environmental education include knowledge, attitudes, skills and participation.

Ecoliteracy

As stated before, there are many ways to enhance environmental awareness. This thesis chose to focus on investigating the potential of literacy about environmental issues in strengthening environmental awareness. There are multiple different definitions of literacy about the environment, such as environmental literacy, ecological literacy and ecoliteracy, and they differ in content and objectives (McBride et al., 2013). This research is going to focus on ecoliteracy, as this concept seems to be more embedded in existing literature about raising environmental awareness than other kinds of literacy. Furthermore, ecoliteracy aims to create just members of a sustainable society. This connects perfectly with the case study of Utrecht, where environmental awareness campaigns are used to enhance active citizen participation for urban greening. The concept of ecoliteracy includes gaining knowledge about the environment, developing skills to solve environmental problems and realising actual sustainable behaviour change (McBride et al., 2013). Moreover, ecoliteracy focusses on collective awareness, where individuals become aware and responsible citizens of a sustainable community (McBride et al., 2013).

Capra (1997) defined ecoliteracy as '(..) an understanding of the principles of the organization of ecosystems and the application of those principles for creating sustainable human communities and societies.' On behalf of the Centre for Ecoliteracy, Capra (1997) identified four competencies of ecoliteracy. The content of these competencies described by McBride et al. (2013) are presented in the table below. Firstly, an ecoliterate individual understands the principal aspects of ecology and how ecosystems are (in)directly affected by humans (Head/cognitive competency). Secondly, ecoliteracy includes the moral values concerning the environment and all living organisms in general (Heart/emotional competency). Thirdly, an ecoliterate person adapts their behaviour to their obtained environmental knowledge and acts as a member of a sustainable society (Hands/active competency). Lastly, ecoliteracy enhances the appreciation of nature and connects all living organisms on earth (Spirit/connectional competency). Head, Heart, Hands and Spirit may be seen as important indicators for the extent to which ecoliteracy is substantiated (Table 1).

Table 1. [The four key competencies of ecoliteracy, adapted from McBride et al., (2013)]

Four key competencies of ecoliteracy:	Definition:
1) **Head; cognitive competency**	(to) approach issues from a systems perspective,

		understand fundamental ecological principles (networks, nested systems, cycles, flows, development, dynamic balance), think critically, assess impacts and ethical effects of human actions, envision long-term consequences of decisions.
2)	**Heart; emotional competency**	(to) feel concern, empathy, and respect for other people and living things, appreciate multiple perspectives, commit to equity and justice for all people.
3)	**Hands; active competency**	(to) create and use tools and procedures required by sustainable communities, turn convictions into practical and effective action, assess and adjust uses of energy and resources.
4)	**Spirit; connectional competency**	(to) experience wonder and awe toward nature, feel reverence for the Earth and all living things, feel a strong bond with and deep appreciation of place, feel kinship with the natural world and invoke that feeling in others.

Besides these four principal competencies, another important instrument to increase ecoliteracy can be identified in academic literature. This so-called concept of ecopedagogy is described by Kahn (2008) as an ideology that specifically aims to enhance collective ecoliteracy among citizens. Ecopedagogy may be identified as a theory that derived from the earlier theories about critical pedagogy of Paulo Freire. Kahn (2008) describes the aims of ecopedagogy as a way to obtain knowledge about environmental issues. Important concepts connected with ecopedagogy are sustainability, planetarity (identifying oneself as an earthling) and biophilia (the love for all kinds of life, including all living organisms) (Kahn, 2008). Because ecopedagogy may be seen as an instrument to foment ecoliteracy (Kahn, 2008), it is an important indicator for the extent to which principles of ecoliteracy are present in policy designs. Two of the three main concepts of ecopedagogy may even directly enhance the emotional and connectional competencies of ecoliteracy. Biophilia, that can be described as the appreciation and love for all kinds of life (Kahn, 2008) may increase the emotional competencies that include the respect and empathy for all living things (McBride et al., 2013). Furthermore, identifying oneself as an earthling (planetarity) may foment connectional competencies by appreciating all living beings on planet Earth.

Environmental awareness campaigns
One of the principal goals of environmental awareness campaigns is, of course, to raise environmental awareness among citizens (Scholtz et al., 2016). However, this aim can be (in)directly conducted in

multiple ways and through various instruments. The contribution of environmental awareness campaigns is clear as they play a significant role in enhancing both the environmental awareness and responsibility of individuals (Mooney et al., 2009) and as they can specifically lead to behaviour change in the form of adapting a more sustainable lifestyle (Scholtz et al., 2016). This research will specifically investigate the potential of ecoliteracy as a set of guiding principles for designing awareness campaigns that aim to increase environmental awareness and realise actual behaviour change. In this way, awareness campaigns can enhance environmental awareness among citizens both directly and indirectly, by fomenting ecoliteracy.

The multiple different concepts and theories and their mutual connections that have been identified, are presented in the following conceptual framework:
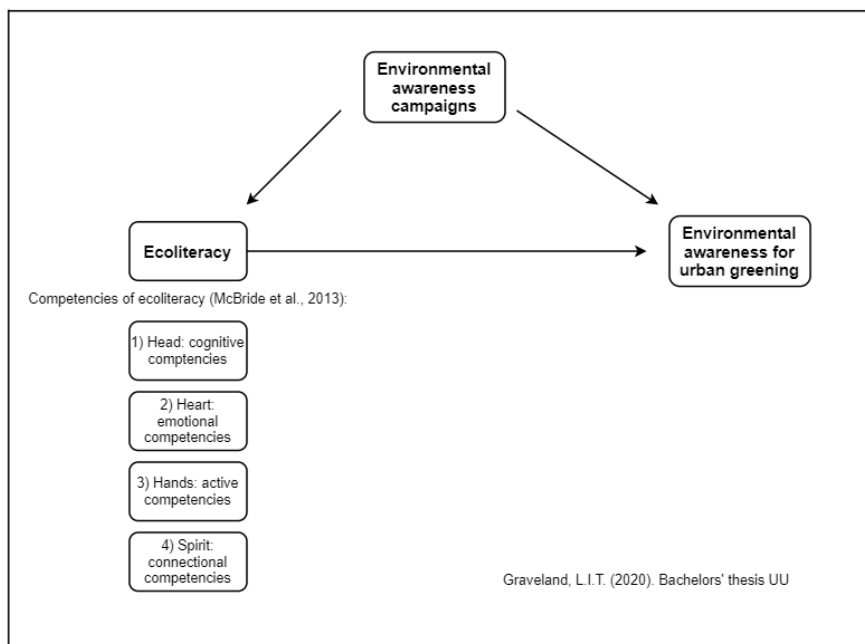

Figure 1. [Conceptual framework with key concepts]

Case study in Utrecht

As included in the goals of the Paris Agreement of 2015, governments from multiple different countries, including the Netherlands, attempt to prepare their urban areas for the effects of climate change and extreme weather changes on both national and local levels (United Nations, 2020). This research will specifically analyse existing environmental awareness campaigns in Utrecht as a case study. The choice was made to focus on the case of Utrecht as the need for active citizen participation in urban greening projects in Utrecht is urgent. Both the province and the municipality of Utrecht, the Netherlands, aim to become completely climate adaptive by 2050 (Hoogheemraadsschap De Stichtse Rijnlanden, 2020). The municipality of Utrecht states in an annual report from 2019 that the awareness about the implications of climate change among citizens of Utrecht is increasing (Gemeente Utrecht, 2019). Unfortunately, so are the effects of climate change on the weather (KNMI, 2018) causing the quality of living to decrease in the city of Utrecht (Staat van Utrecht, 2020). Currently, the city of Utrecht is not yet climate adaptive enough to deal with the future effects of climate change. This is, for example, expressed by the fact that the majority of gardens in Utrecht (53,6%) are still mostly tiled (Cobra Groeninzicht, 2018) and contribute therefore to increasing heat stress and the incapability of storing precipitation. The municipality of Utrecht has already designed and implemented multiple policies to enhance the climate adaptiveness of the city. For example, the Waterproof030 project of

the municipality includes top-down activities such as constructing water-permeable pavements and climate adaptive sewers that can drain more rainwater (Gemeente Utrecht, 2020). However, the municipality is not the only important stakeholder for conducting urban greening strategies. Approximately 60% of the total surface of Utrecht is owned by private companies or inhabitants (Gemeente Utrecht, 2020). Realising the climate adaptiveness of all these private spaces is a difficult task for the municipality to fulfil alone, therefore active citizen participation in urban greening projects is urgently needed in Utrecht. Besides citizen participation, actions from business with private properties in Utrecht are also needed, as they own a significant percentage of the city as well. However, due to time constraints, the scope of this thesis includes only citizen participation for urban greening projects.

Methods

Data collection

This thesis was conducted by systematically answering the sub questions and the main research question by combining the gained knowledge from the sub questions. The three sub questions were answered by conducting empirical research. The conceptual framework formed the basis on which the empirical research took place, as it operationalised the presented key concepts. Data was mostly collected through qualitative data methods, specifically by conducting semi-structured interviews and analysing grey literature. Grey literature includes policy documents and websites about urban greening and/or awareness campaigns of municipal stakeholders and other actors linked to the municipality. In this case, only grey literature about campaigns that have been discussed during the interviews was analysed. The grey literature useful for this study was selected on the basis of what organisation websites and interview participants shared. Furthermore, a selection was made from which documents were useful for the thesis and concerned the research topic. The grey literature used for the research consisted of the website of the IVN, the NMU and the municipality, the façade garden flyer of the UN and the information sign of the tiny forest.

In practice, the grey literature was mostly used to gain a general overview of the content and aims of the multiple organisations and awareness campaigns. A more in-depth analysis of the content of the campaigns and the presence of the four key competencies of ecoliteracy took place during the semi-structured interviews with important actors. In the case of this research, important actors include stakeholders involved in the design or implementation process of environmental awareness campaigns about urban greening in Utrecht. For this study, employees from both the municipality of Utrecht, and other relevant foundations located in Utrecht such as Utrecht Natuurlijk, GroenMoetJeDoen, Natuur en Milieufederatie Utrecht and IVN Utrecht have been interviewed. These employees include both policy designers and policy conductors, such as project managers. In the table below the function and organisation of the research participants are presented. As they remain anonymous, their names are not mentioned. Furthermore, the table shows how the six different interviews are referred to within the results section of this thesis and which campaign(s) they have worked with.

Function and organisation of the research participant:	Reference in the text:	Campaign(s):
1) Urban water management consultant for the municipality of Utrecht	Interview 1 (Int. 1)	Waterproof030
2) Head program design at Utrecht Natuurlijk (UN)	Interview 2 (Int. 2)	Façade gardens

3) Project manager at the Institute for Nature Education in Utrecht (IVN)	Interview 2 (Int. 3)	Groen Doet Goed Tiny forest
4) Project manager 'Climate Adaptation and Green-Blue City' at the Nature and Environment Federation Utrecht (NMU)	Interview 4 (Int. 4)	Groen aan de Buurt
5) Member of the foundation Groen Moet Je Doen in Utrecht	Interview 5 (Int. 5)	Groen Moet Je Doen
6) Program design 'Green City' at Utrecht Natuurlijk & municipal coordinator of the Groen Doet Goed campaign	Interview 6 (Int. 6)	Groen Doet Goed Groen Moet Je Doen

Table 2. [Interview participants and connected campaigns]

Due to the time constraints that this study is bound to, a total of six interviews have been carried out during a period of four weeks. The interview questions were constructed on the basis of the main research question and sub questions. The construction of the interview guide was based on the book 'Social Research Methods' (Bryman, 2016) and the information provided at various courses and workshops by the Utrecht University about conducting interviews.

Data Analysis
The data processing approach that this research used for analysing the content of the interviews and the grey literature includes transcribing the interviews and coding the content. The relevant parts of the transcribed interviews and grey literature were highlighted with different colours in word and were put into a mind map, where important concepts and insights were highlighted in different colours and connected. The multiple steps during the data analysis consisted of the following:
1. The recorded interviews are transcribed.
2. Content is coded by using highlighting colours and mind maps.
3. Observation and systematic analysis of data outcome.
4. Interpretations, implications and conclusions of the data outcome.

The data analysis consisted of studying the content and aims of the campaign and focused on operationalising whether the four key competencies of ecoliteracy were present within the campaigns. On the basis of the content of the interviews and grey literature, the extent to which the competencies were included as main objectives during the design or implementation phase was analysed.

Ethics
It is important to make sure that the personal data of research participants, gathered during the interviews, is handled properly. Data confidentiality was maintained by only reporting the organisation where the participants work and their function in the thesis. Moreover, all interview participants have had the possibility to remain anonymous and have had the right to ask the researcher to keep certain information confidential. Furthermore, all research participants and the researcher herself have signed a consent form at the beginning of each interview, that states that the interview is conducted with mutual consent and all collected data will be stored securely. Because all interviews took place online due to the COVID-19 circumstances, the consent forms were 'signed' by reading the form aloud and

recording the answers to the multiple questions of the consent form. The recording serves as proof that the participants have 'signed' the consent form and agree with its content. The recordings of the interviews will be deleted at the end of august 2020 the latest.

Results

In this section, a description is provided of the content and aims of the six different campaigns from the perspective of the interviewees. Thereafter, the aims of each campaign are linked with the extent to which the four competencies of ecoliteracy are present within the campaigns. Furthermore, the outcomes of the interviews are presented in a table overview and each competency is discussed individually.

Campaigns

1. Waterproof030

Content:

The Waterproof030 campaign focussed specifically on making the city of Utrecht waterproof. Other climate adaptation objectives such as decreasing heat stress or increasing biodiversity were consciously not taken into account within this campaign, although the municipality acknowledges its potential (Int. 1). During the implementation process, the Waterproof030 campaign was conducted by the municipality of Utrecht in two phases. Firstly, the policymakers aimed to implement the campaign as a 'guerrilla campaign', an online citizen movement that was not linked to the municipality. The municipality thought that some messages within a campaign are more likely to be heard and accepted by citizens when they do not come from a top-down governmental institution, such as the municipality (Int. 1). The campaign, being detached from the municipality or other governmental organisations, started thus from a bottom-up perspective by supporting citizen initiatives for urban greening. However, a counsellor from the municipality wanted to add the Waterproof030 campaign to the official agenda of the municipality, causing the campaign to be visibly linked to the municipality again, by using for example its official logo at social media websites.

Aims and Goals:

In the case of the Waterproof030 campaign, the message that the municipality wanted to communicate is to make private gardens more waterproof and climate adaptive (Int. 1). The main goal of the campaign was to prevent flooding in the city. Enhancing the environmental awareness among cities was therefore only an indirect subgoal (Int. 1). The campaign focussed mostly on activating citizens to make their private properties more climate adaptive by for example providing subsidies for installing green roofs or spreading information about urban greening opportunities (Int. 1). The campaign sought to inform people only at a very minimal basis about the reason why climate adaptation is important. Informing citizens only took place by referring to earlier extreme weather events and linking this to the fact that cities need to adapt to these new circumstances.

2. Façade gardens

Content:

The façade garden campaign was conducted by Utrecht Natuurlijk (UN), a foundation focused on nature and environmental education. It is mostly financed by the municipality. The façade garden campaign revolved around creating and disseminating a flyer with information for citizens about how to create a façade garden (Int. 2). The flyer was placed at the multiple locations of UN and at other public spaces in Utrecht, such as the public library and neighbourhood offices (Int. 2). Furthermore the flyer and some extra information is available on the website of the UN.

Aims and Goals:

The ultimate aim of the campaign was that lots of citizens actively create a façade garden surrounding their house (Int. 2). The campaign therefore included informing citizens in order to activate them. Most of the information provided in the flyer was already quite practical and concerns mostly tips about ways to create a façade garden (Utrecht Natuurlijk, 2020). Another aim of this campaign was that citizens excite others to create a façade garden as well (Int. 2). The flyer mentioned that neighbours can inform each other about the idea to create a façade garden, so that maybe more people in the street will participate. Therefore, the campaign wanted to create a new social norm where it is quite standard that people have façade gardens. The most important criterion for the campaign was that citizens are informed in the right way about how to create a façade garden (Int. 2).

3. Groen Doet Goed

Content:
The Institute for Nature Education (IVN) executes an ongoing campaign called Groen Doet Goed (GDG). This campaign concerns the connection between children and nature. The target audience of this campaign are children from 4 to 12 years that live in relatively paved neighbourhoods (Int. 3). The GDG campaign involves organising fun and educational activities with children in natural surroundings in their neighbourhood (IVN, 2020).

Aims and Goals:
The main aim of the GDG campaign is to let children from paved neighbourhoods have at least one meaningful experience with nature before their twelfth birthday (Int. 6; IVN, 2020). By doing so, the IVN hopes that children from relatively paved neighbourhoods will enjoy nature more and will therefore become future nature protectors (Int. 6).

4. Tiny forest

Content:
The IVN also implements an ongoing campaign about tiny forests in the province of Utrecht, including the city of Utrecht. This tiny forest campaign is about planting multiple tiny forests in cooperation with an civilian initiator and other citizens that live nearby the tiny forest. The IVN therefore works closely together with citizens (Int. 3).

Aims and Goals:
The main goals of the tiny forest campaign concern both making urban areas more climate adaptive and increasing biodiversity. Furthermore, the tiny forests serve as a way to let citizens experience nature in their neighbourhood and to inform them about the benefits of tiny forests on urban areas (Int. 3).

5. Groen aan De Buurt

Content:
The Nature and Environment Federation Utrecht (NMU) conducts multiple campaigns on a provincial level. For this thesis, a particular campaign called Groen aan de Buurt has been analysed. This campaigns included activating citizens to green their own living environment, both public and private properties. The campaign did so by providing practical services, for example helping citizens to find subsidies and creating an implementation plan to realise green projects (NMU, 2020). Furthermore, the NMU provided practical information and tips based on experiences from other green projects (Int. 4).

Aims and Goals:
By providing practical services and information, the Groen aan de Buurt campaign aimed both to inform citizens about urban greening and to actively stimulate them to undertake action by making their own living environment more climate adaptive (Int. 4). The NMU recognized creating

environmental awareness as an important goal and as a mean to bring about sustainable behaviour (Int. 4).

6. Groen Moet Je Doen

Content:

The foundation Groen Moet Je Doen consists of citizens that are actively conducting urban greening activities in their neighbourhood. These so-called nature based self-management projects are implemented in the whole city of Utrecht. Each year, the foundation organises the Groen Moet Je Doen Dag, when involved citizens of urban greening projects come together and share their ideas (Int. 5). This day also includes a tour by bike past all the involved urban greening projects.

Aims and Goals:

The main goal of the foundation is to create a climate adaptive city of Utrecht by drawing more attention to the self-management of public green areas by citizens (Int. 6). Therefore, the foundation sees bottom-up urban greening projects as a promising and important means to realise this state of climate adaptiveness in the city (Int. 5).

Key competencies of ecoliteracy

The table below presents an overview of which competencies are present within each campaign.

As this research focusses on operationalising whether the four key competencies of ecoliteracy have been included in the design or implementation of the environmental awareness campaigns, the next part of the results section will discuss the extent to which each competency is individually present within the different campaigns.

	Head	Heart	Hands	Spirit
1) **Waterproof030**			x	x
2) **Façade gardens**		x	x	x
3) **Groen Doet Goed**		x	x	x
4) **Tiny forests**	x	x	x	x
5) **Groen aan de Buurt**	x		x	
6) **Groen Moet je Doen**	x		x	x

Table 3. [Presence of ecoliteracy competencies]

Head / cognitive competency

This competency was present in three out of six analysed campaigns. The tiny forest, Groen aan de Buurt and Groen Moet Je Doen campaigns did specifically include the cognitive competency as a main objective. Information about the tiny forest itself and the reason why it is planted was mostly provided at information signs in the tiny forest and during information evenings in the neighbourhood (Int. 4). However, the knowledge provided at the signs was not very detailed, as little background information about ecosystems and climate adaptation is provided. Nevertheless, the campaign aimed to inform both children and adults about these subjects, but in a more subtle and indirect way. The Groen aan de Buurt campaign especially aimed to expand the environmental knowledge of citizens by informing them about the importance of nature and human influences on ecosystems (Int. 4). By organising the yearly tour around multiple urban greening projects, the Groen Moet Je Doen campaign aimed to inform citizens about the possibilities for urban greening activities along with potential benefits (Int. 5). However, interviewee 5 acknowledged that the campaign did not provide any profound knowledge about ecosystems or human influences as the GMJD foundation believes that most involved citizens already have this information.

The Waterproof030, façade garden and Groen Doet Goed campaigns did not include this competency as an main objective. The main goal of the Waterproof030 campaign did not include informing citizens about (human influences on) ecosystems and raising their environmental awareness (Int. 1). The main information that was provided in the campaign consisted of practical information about ways to make gardens more climate adaptive and did not contain much information about reasons behind this (Int. 1). Informing citizens about ecosystems and climate change only took place by referring to earlier extreme weather events in Utrecht and linking this to the fact that the city needs to adapt to these new circumstances. Although a lot of information was provided in the façade garden flyer, most of it concerned practical knowledge about how to create a façade garden (Int. 2). The flyer provided a few arguments for why urban greening is a good idea for both humans and the environment (Utrecht Natuurlijk, 2020). However, it did not contain extensive information about the way that ecosystems work or about climate change and climate adaptation. As the target audience of the Groen Doet Goed campaigns concerned children, the activities were more focused on experiencing nature than providing profound knowledge about the environment (Int. 6). Therefore, the children are mostly indirectly involved in creating environmental awareness, as experiences with nature contribute to environmental awareness on a more subconscious level.

Heart / emotional competency
Three out of the six campaigns included this competency. The façade garden, Groen Doet Goed and tiny forest campaign included the emotional competency of ecoliteracy as a main goal. For example, the flyer about the façade gardens was designed in an aesthetic way with pictures of beautiful flowers, so that it looked fun and attractive for people to read it. The flyer therefore responded to the positive feelings that people who read the flyer (already) had towards nature and it aimed to strengthen the extent of appreciation for nature. The Groen Doet Goed campaigns had the aim that children develop more appreciation for their environment and that they acknowledge its importance by experiencing nature from a young age (Int. 3; Int. 6). The tiny forest campaign had corresponding aims, as the campaigners of the tiny forest project believed that by experiencing nature in their own neighbourhood, local residents develop more appreciation for their environment and its importance (Int. 3). The Waterproof030, Groen aan de Buurt and the GMJD campaign did not actively include the emotional competency as a main objective as they did not include objectives about increasing feelings of appreciation or empathy towards nature and did not have the aim to encourage a specific emotional bond between citizens and nature (Int. 1; Int. 4; Int. 5).

Hands / active competency
All six campaigns included the active competency of ecoliteracy as a main goal. The Waterproof 030 campaign aimed to activate citizens to make their gardens waterproof, so that gardens and urban areas in general were more embedded within surrounding natural ecosystems (Int. 1). The campaign did this by for example giving subsidies for urban green projects and providing practical tips about making gardens waterproof. The main aim of the façade garden campaign corresponds with the aims of the Waterproof030 campaign. However, it focussed specifically on the creation of façade gardens as part of a climate adaptive garden (Int. 2). Building a sustainable society was an important factor to achieve this goal. One of the aims of the GDG campaign was that children become actively involved in protecting nature and that they are the next generation of nature protectors (Int. 6). As for the tiny forest campaign, local residents were asked to actively help by planting and maintaining the forest (Int. 3). The campaign therefore aimed to actively involve people with urban greening projects. The main goal of the Groen aan de Buurt campaign was to provide citizens with practical tools to act more sustainable and to give them some perspective about what the positive effects of these actions are for the environment (Int. 4). The campaigns achieved this by providing guidance in finding subsidies to

realise urban greening projects, creating implementation plans and sharing practical information and experiences from existing projects (NMU, 2020). The GMJD campaign aimed to initiate new bottom-up urban greening projects by inspiring and informing citizens. Activating citizens into urban greening was therefore one of the main objectives of the campaign (Int. 6).

Spirit / connectional competency
Five out of the in total six campaigns analysed for this research included the connectional competency as a main goal. Waterproof030 aimed to mainstream the fact that urban greening is the new norm (Int.1), this can be done by sharing perspectives and invoking ideas about urban greening by others. By aiming to change the social norms for urban greening, the Waterproof030 campaign encouraged citizens to adopt more sustainable behaviour. The opening title of the façade garden flyer was: "Do you see all those façade gardens in Utrecht as well?" (Utrecht Natuurlijk, 2020). This title gave the impression that already many people in Utrecht have created a façade garden and were therefore part of a certain, sustainable, community of which the reader of the flyer could take part in as well if he/she created a façade garden too. Thus by using this title, the campaign tended to create a collective feeling of a community of people that (aim to) have a façade garden and want to contribute to urban greening (Int. 2). Furthermore, the flyer activated people to share their ideas with others and to involve their neighbours in creating a façade garden together (Utrecht Natuurlijk, 2020). One of the main goals of the GDG campaign was that children develop feelings of wonder towards nature, when they experience it from up close (Int. 3; Int. 6). The tiny forest served as a place to come together and experience and enjoy nature together (Int. 3). The tiny forest campaign aimed to increase feelings of wonder towards nature among visitors of the tiny forest. The Groen Moet Je Doen day aimed to inspire participants during the bike tour with examples of urban greening projects and to share ideas and perspectives about this subject as a whole (Int. 5). Only the Groen aan de Buurt campaign did not recognize this competency as an objective. However, interviewee 4 sees it as a potential positive side effect of the Groen aan de Buurt campaign.

Discussion

The discussion section of this thesis will present the interpretations of the obtained results. Furthermore, the implications for society and the academic world are discussed. The discussion ends by critically reflecting on the limitations of this study and by providing some recommendations for future research on this topic.

Interpretation / observations

Firstly it is important to mention that none of the interviewed participants were very familiar yet with the concept of ecoliteracy and that they did not use the key principles of this concept consciously when designing and/or conducting the campaigns. This implicates that the concept of ecoliteracy is not (yet) universally known among policymakers. However, all interviewed participants were very interested in the concept and some even saw the potential in using it more consciously as a guiding principle when designing and/or implementing awareness campaigns in the future.

The results implicate that the Waterproof030 and the façade garden campaign have a lot of goals and aims in common. This might be explained because Utrecht Natuurlijk and the municipality work closely together on the subject of climate adaptation in Utrecht and because they partly share the same policy methods and visions. This seems like a logical finding as UN used to be part of the municipality and, although it is an independent foundation since a few years, it is still mostly subsidized by the municipality of Utrecht.

The third competency (Hands) is the only competency that was present in all campaigns. This can be explained by the fact the campaigns are all specifically focused on practical actions. The focus of each campaign is in any case partly about stimulating citizens to adapt sustainable behaviour and to act green by conducting urban greening activities of some sort. Every campaign aims to activate citizens, but they use different strategies to realise this goal by for example informing, providing (financial) tools or giving tips. The cognitive competency is only present in half of the analysed campaigns. Although every campaign aims to inform citizens in one way or another, this information did not always include profound knowledge about ecosystems and it was also not always the aim of the campaign to provide a lot of background information. Some campaigns only provided the most necessary information about practicalities concerning urban greening activities. The campaigns do have the aim to inform citizens, but not as profound about ecosystems, climate change and climate adaptation as described in the academic literature concerning the cognitive competency (Capra, 1997). Multiple interviewees have mentioned that the reason why they did not include very detailed information about this subject was because they expected citizens to make the connection between urban greening and climate adaptation themselves.

Each campaign included at least two key competencies as their main objective. To refer back to the main research question, this implicates that all analysed environmental awareness campaigns in Utrecht contribute to enhancing ecoliteracy to some extent. The extent to which this happens strongly correlates with the main aims of the campaign and which strategies are put in place to realise these goals. All campaigns had the aim to increase the environmental awareness among citizens by activating them, however they had a different focus and/or different visions how to realise this goal. Therefore, they included different competencies of ecoliteracy as objectives. Although some competencies (Hands and Spirit) are more often present within the analysed campaigns, it is not yet clear from existing academic literature whether these competencies are more important than others. However, the outcomes of this research suggest that the active and connectional competencies are, at least in practice, considered as more relevant than the cognitive and emotional competencies.

Most analysed campaigns focused on activating and connecting citizens. To conclude, the research outcomes imply that environmental awareness campaigns to a certain extent do contribute to enhancing ecoliteracy among citizens, as they include several of the key competencies of ecoliteracy. The question remains whether all four competencies are need to be present in order to become an ecoliterate individual. As not much has been written about this subject, this is an interesting question for future research to study.

Implications

The outcomes of this research have important implications to both society and the academic world. This thesis has provided new insights about the potential contribution of ecoliteracy to the effectiveness of environmental awareness campaigns. Ecoliteracy has a high potential in raising awareness and thus in enhancing the effectiveness of environmental awareness campaigns as well. The aims of the campaigns correspond to some extent with the key competencies of ecoliteracy. Therefore, by including the key principles of ecoliteracy, campaigns can enhance their effectiveness. This thesis recommends that during the design and implementation process of future awareness campaigns, all competencies are more consciously included as objectives. This can be done, for example, with the implementation of ecopedagogy strategies (Kahn, 2008).

When designing, evaluating and implementing existing and future campaigns, the outcomes of this research might be used to increase the effectiveness of the campaign. An increase of the effectiveness of environmental awareness campaigns for citizen participating for urban greening might lead to actual sustainable behaviour change (Zsóka, 2008) and more bottom-up initiatives for urban greening. Subsequently, for the broader field of sustainability, more bottom-up initiatives for urban

greening increase the amount of climate adaptation activities, that lead to a more climate resilient city. As urban greening activities can be identified as a nature based solution, an increase in urban greening activities is also beneficial for biodiversity and health conditions (Dorst et al., 2019; Tzoulas et al., 2007). Furthermore, an increase in citizen participation for urban greening policies improves the quality of green infrastructure governance, as it contributes to good and mosaic governance strategies. (Lockwood, 2010; Buijs et al., 2019).

Moreover, the outcomes of this study have some implications for the academic world. This thesis has served as an external validity check because it has partly bridged the knowledge gap about how theoretical ecoliteracy has been translated into practice within environmental awareness campaigns. All four key competencies of ecoliteracy as described by Capra (1997) are recognized among the multiple analysed campaigns. This implicates that all described competencies are relevant for enhancing ecoliteracy. However, the findings might also challenge the current academic understandings of ecoliteracy, as not all competencies were equally present. Where academic literature does not make any distinctions between the four competencies regarding their importance (McBride et al., 2013), the results implicate that the cognitive and emotional competencies are considered as less relevant by policymakers for raising environmental awareness, as they are included less often than the active and connectional competencies. Moreover, the tiny forest campaign was the only campaign that included all four competencies as objectives. To refer back to the research question, it can be concluded that this campaign therefore achieved best in enhancing ecoliteracy among citizens. As this thesis has not looked into the actual effectiveness and goal attainment of the campaigns, it is not clear whether the presence of more ecoliteracy competencies also imply higher effectiveness regarding environmental awareness gains.

Limitations

The analysed campaigns were conducted by multiple organisations that have very different roles in society, both top-down and bottom-up, and therefore different aims and strategies as well. Although the diversity of these organisations made the research more inclusive, it also makes it more difficult to say something about the research outcomes, as the findings were quite different.

The thesis has focused particularly on the content and aims of the awareness campaigns and whether they have included one or more of the main principles of ecoliteracy as an objective. Therefore, there was little focus on the actual effects of the campaigns in practice. Questions about the effectiveness of the campaign have been discussed with the interviewed participants, but interviewees mentioned that most aims and goals were difficult to measure in practice. It would be interesting for future research to elaborate more on the actual effects and goal attainment of the campaigns. However, the findings of this research are still relevant, as it provides some insight about what environmental awareness campaigns aim to realise.

Conclusion

This thesis aimed to answer the following research question: To what extent do existing environmental awareness campaigns contribute to enhancing ecoliteracy among citizens? The research focused on collecting new insights about the potential contribution of ecoliteracy to the effectiveness of awareness campaigns by analysing the extent to which the four key competencies of ecoliteracy are present within these campaigns. Qualitative research methods found that all four competencies are more or less included as main objectives within the campaigns. Therefore, this research implies state that awareness campaigns do enhance ecoliteracy among citizens to some extent. However, this highly depends on the aims of the different campaigns. Furthermore, the competencies were not equally present, as the active and connectional competencies are more often included as main objectives

within the campaigns. This implicates that the Hands and Spirit competencies are (subconsciously) considered as more relevant by policymakers for raising environmental awareness than the Head and Heart competencies.

The outcomes of this research can serve as important knowledge to take into account when designing and implementing future environmental awareness campaigns. The effectiveness of the campaigns in enhancing environmental awareness and citizen participation might increase by including all competencies of ecoliteracy as main objectives. To the broader field of sustainability, this implies that more bottom-up activities for urban greening would occur and therefore urban areas would become more climate-adaptive. Furthermore, the academic implications of this thesis include partly bridging the knowledge gap concerning the way in which theoretical ecoliteracy has been translated into practice.

The thesis suggests some recommendations for future research concerning ecoliteracy and environmental awareness campaigns. Firstly, it would be interesting to elaborate more on the actual effectiveness and goal attainment of environmental awareness campaigns in practice. Secondly, from existing literature it is not very clear yet whether all four key competencies need to be present within a campaign in order to effectively raise environmental awareness. This would be an interesting topic to study in the future.

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