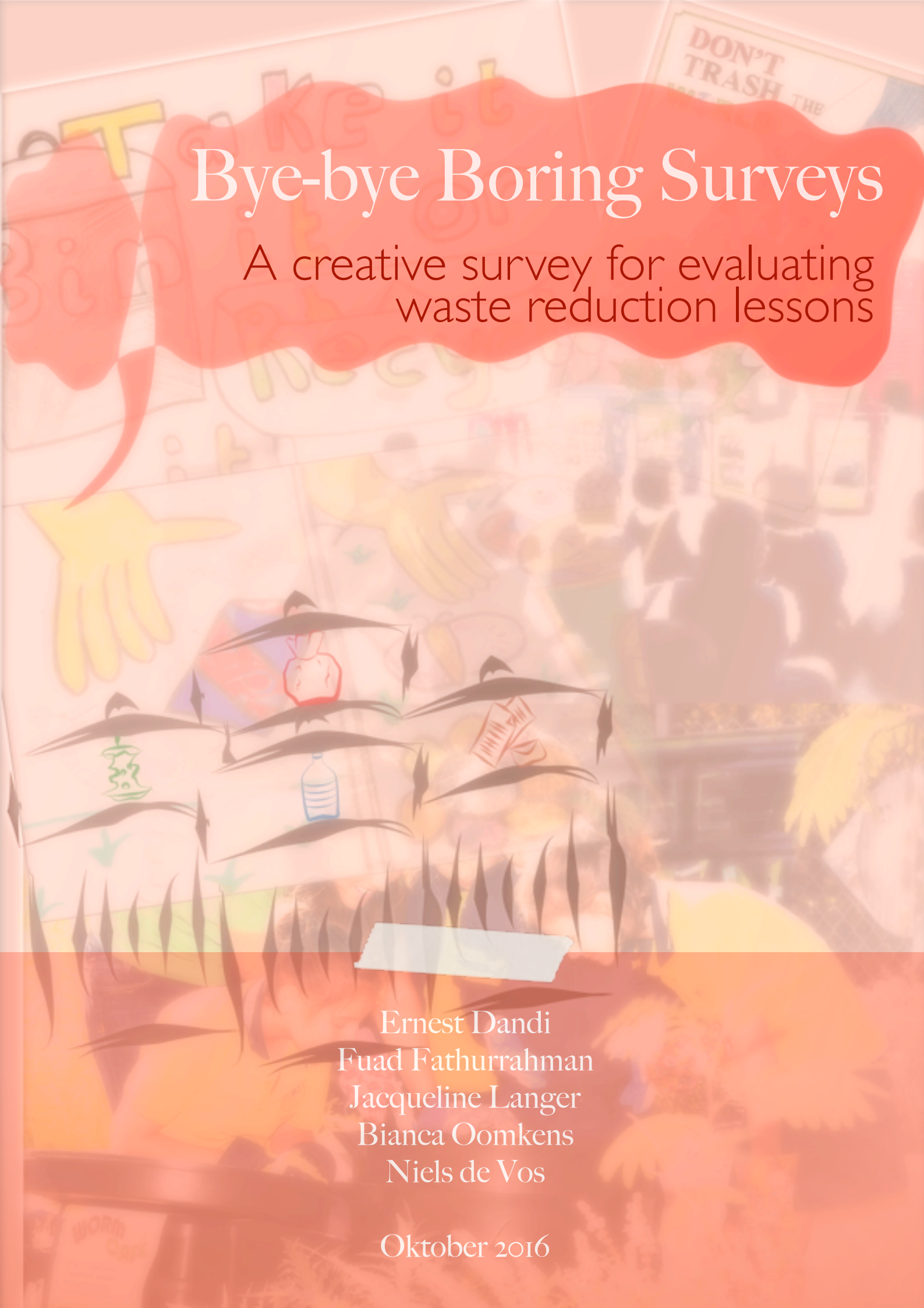
Bye-bye Boring Surveys

A creative survey for evaluating waste reduction lessons



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Abstract

Nowadays, no evaluation exist for waste reduction lessons in the Netherlands. For that reason this project was aimed to establish a monitoring method for the WRLs in group 7 & 8. The method used for this project is a mixed-method design, that includes two interviews, attending the meeting of Werkgroep Zwerfafval in Utrecht, two brainstorm sessions, a questionnaire and literature study. The results are that monitoring should focus on six different determinants: *knowledge, awareness, attitude, empowerment, social norms and enjoyment*. Additionally, the desired *behaviour* itself needs to be considered and possible problems within the *process* as well. Each determinant should include different indicators. For example, one of a diversity of indicators for *attitude* is *the pupil wants to make a change regarding the waste problem*. Different tools which came up for measuring the different indicators of the range of determinants were *mind map, ABC-letter, 3 lies/1 truth, drawing, statement game, abcd questions, spiderweb, counting lunch boxes, a checklist for the teacher* and so on. After the establishment of the determinants, indicators and tools, a creative survey was established. Since it takes less time than other measurement tools (interviews, focus groups) and do not only include abcd questions. Regarding time, reliability and validity we chose to use the tools *mind map (knowledge), 3 lies/1 truth (awareness), the spiderweb (social norms), statements (attitude) and flower power (empowerment). Behaviour, process* and *enjoyment* should be accessed by the teacher him-/herself and will not be accessed in the creative survey, because of feasibility. For these factors other measurements are used. Unfortunately not every indicator will be measured in the tools, because of the feasibility.

Keywords

Waste reduction lessons (WRLs), pupils, monitoring method, group 7 & 8, teacher(s), creative survey

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1. Introduction

1.1 The plastic problem

Six times the mass of zooplankton, that is the estimation of plastic in the ocean (Moore et al. 2001; Moore & Phillips 2011). The start of the problem of litter and the plastic soup is a long time ago and not easy to recall, since litter has been there for ages. Since the start of a commercial system in the 1970s for manufacturing plastic grocery bags to the supermarket industry, the problem is getting bigger and bigger (Macur & Pudlowski 2009). Jambeck et al. (2015) stated that "in 1975, the estimated annual flux of litter of all materials to the ocean was 6.4 million tons". This amount was 288 million tons in 2012. In that 37 years, consequently, an increase of 620% took place (Jambeck et al. 2015). Just in the year 2010, about 12.7 billion kg new plastic debris entered the sea (Jambeck et al. 2015). These plastic particles are in a diversity of sizes, complete products can be found but also polymer molecules. These size distributions also carry the risk of inhaling the plastic or taking the plastic up by skin (Moore & Phillips, 2011; Kaiser, 2010). The exact extent of risk for marine life is not clear by now (Kaiser, 2010), but there is evidence that some marine life ingests plastic (Bråte et al. 2016; Santos et al. 2016). However, the plastic that is taken up by marine life is also a hazard to human health due marine food (Marks & Howden, 2008; Thompson et al. 2009).

1.2 Waste reduction lessons

Environmental education (EE), more precisely waste reduction lessons (WRLs) at primary schools, are a popular and encouraging method to reduce the amount of new litter in the ocean. The WRLs care about the reduction of new litter by making people aware of the problem and change their behaviour (Bonnett & Williams, 1998; Orams, 1997; Rickinson, 2001; Palmberg & Kuru, 2000; Hsu, 2004). The obtained effects like a change in attitude and gained knowledge regarding the environment can also remain on the long scale. At least for one to two years there is evidence for remaining effects (Farmer, Knapp & Benton 2007; Kuhar et al. 2010).

1.3 Evaluating interventions

At the moment there is no evaluation of these lessons in the Netherlands, since there is no method to do so. Such a method is important to create, because you have to know if the educational design meets the learning objectives (Orams 1996; Heimlich 2010). Many community-based studies have even shown the value of applying behaviour analysis to stimulate environment-protecting human behaviour (Geller 1992; Geller 1995; Dwyer et al. 1993; Huffman et al. 1995). A stimulation of environment-protecting behaviour as side effect would in the case of WRLs even enhance the desired effect of the lessons.

As the contact of pupils with an environmental educator is typically zero or once (Het Groene Wiel, 2015), behaviour should be measured by a teacher, who is regularly in contact with the pupils. Pupils are also used to be assessed by teachers. Thus, being assessed by the teacher is already a normal situation for the pupils. Cotton (1988) and Baldwin, Adams & Kelly (2009) stated that the monitoring conducted by teachers is a strong predictor. When an unknown person does the evaluation, a different atmosphere can be created which can also lead to another result.

1.4 Problem statement

Furthermore, the pupils at primary schools who are getting WRLs are all experiencing different kinds of WRLs. These different lessons are also used differently in different school classes and age groups (Science Shop WUR, personal communication, September 8, 2016). The knowledge about whether these lessons have a behavioural impact is important to gain, because wasting time and money is something people in westerns societies do not want. As the project cannot be properly managed, if impacts cannot be measured. For now, there is not a method for evaluating behaviour change in those different lessons. So you cannot know if there is any behaviour change or a difference regarding behaviour related to the different lessons the primary school pupils got. To get to know the influence of the WRL a monitoring method should be established in order to monitor the effectiveness of such lessons.

1.5 Project aim

To prove and improve the effectiveness of WRLs this project aims to create a method for monitoring the effectiveness of the WRLs in group 7 & 8. Groups 7 & 8 are chosen because in our experience children in this age-category are already capable to make their own decisions, comparing to younger children. Also Arjen Wals (**Appendix 4**) stated in his interview that focusing on one age category was a good decision, since the monitoring method also has to deal with the developmental stage of children. Children progress intensively their way of thinking in the years of primary school. Consequently, different monitoring approaches are necessary for different ages in primary school.

Important factors influencing the establishment of the method are the feasibility regarding time and the suitability of the age-category. One teacher also stated in the questionnaire that teachers do not have a lot of time to monitor. On the factors that needs to be measured like behaviour, a pure survey is not applicable, since pupils will have the feeling that they are measured.

1.6 Three waste reduction lessons

In this project, we focused on three particular WRLs: Zwerfafval, De Klieners and Zwervend Afval out of the 130 WRLs. In this report we will only refer to these lessons, since taking into account all WRLs is not feasible. An important factor is that these lessons are all given by the teachers and not the institutions that design these lessons.

1.7 Structure of the report

In the next chapter, first the main project question will be presented along with three subquestions. Following, a description of the methods will be given. Furthermore, the results of our project will be presented in **chapter 3**. In **chapter 4.1**, a summary of the results will be given. In **4.2 Discussion**, an explanation will be given about why we chose to incorporate certain indicators and tools in our final method. Finally, in **chapter 4.3**, the limitations of our research will be presented.

2. Project questions, Definitions & Methods

In this section of the report, the main question and the subquestions will be described that followed from the introduction. Subsequently, some important definitions will be given, which are important for this project. Finally, the methods used for these subquestions will also be described in detail. First the different methods will be described and at the end these methods will be explained shortly per subquestion.

2.1 Project questions

In **1.5 Project aim**, the project aim is already described. Regarding the project aim the main question of this project is *Which method can teachers use to monitor the learning objectives of WRLs in group 7 & 8?* With the help of three subquestions the main question will be answered:

1. What determinants of behaviour should be addressed in WRLs?
2. What are indicators for measuring these determinants?
3. What tools can be used by teachers to monitor these indicators?

To answer the subquestions, we decided to collect information regarding the subquestions simultaneously. Finally, after answering the subquestions, we will construct a monitoring method, which can be used by teachers in group 7 & 8.

2.2 Definitions

In this project the definitions of some words should be known: *tools, determinants of behaviour, indicators* and *method*. These are their descriptions:

1. *Determinants of behaviour:* Behaviour is shaped by many different aspects like for example knowledge, attitude and the norms within the society. All these aspects, that form the behaviour of each individual, are called "determinants".
2. *Indicator*: Variables, which can show that the desired objectives of the WRLs are achieved.
3. *Method*: A method in this context consists of different tools that can be used to monitor the effectiveness of the WRLs but is not tested scientifically beforehand. The tools in the method are discussed with experts and teachers for feasibility.
4. *Tools*: Tools are part of the method. As interventions tools can be used to measure one factor, like a determinant. A survey is an example of a tool.

2.3 Methods

In the upcoming paragraphs, the methods used for the three subquestions will be described. The general method used for this project is a mixed-method design. In this mixed-method design two interviews, attending a meeting with the Werkgroep Zwerfafval, two brainstorm sessions, a questionnaire and a literature study were executed to answer the main and the subquestions. Since the main focus of this project is not based on a literature study, the methods for conducting the literature study will not be described in detail. Regarding the time restriction of our project and the number of persons in the team, we decided to start simultaneously with the collection of information for all questions. As the progress of answering each subquestion were not consistently, the determination of brainstorm sessions were not in line with the order of our subquestions.

In the upcoming paragraph first an explanation will be given about how we interviewed the interviewees. Subsequently, the different activities, interviews, brainstorm sessions , etc., will be described. So in a chronological order the interview with Arjen Wals (Expert in EE), brainstorm session 1, the meeting of Werkgroep Zwerfafval in Utrecht, brainstorm session 2, the interview with Maartje Langeslag (NME programme author) and the questionnaire for the teacher will be

described. At the end the different activities, which are mentioned before, will be described shortly for every subquestion. Finally we described how we came to an answer for the main question.

2.3.1 Methods for interviewing

The two interviews were held in a semi-structured way. The interviewers were asked questions about their perceptions, opinions, views and other relevant issues. Not all questions were in the interview guide, some came up during the interview. One interview was conducted through Skype (Arjen Wals) and one was held in Apeldoorn (Maartje Langeslag). The interview with Arjen Wals was conducted through Skype, since he was in Sweden. This interview was conducted by one group member, while the rest of the group members were listening, making notes and recording the interview. The interview with Maartje Langeslag was conducted by two team members and was also recorded. From the interviews, information was gathered to answer the subquestions and finally the main question. The interviews were analysed with a top down approach. We sat down and analysed the interviews by coding the interviews and assigning different answers to the suitable subquestion. Since the two interviewees were from different expertises, different interview guides were made, which you can see in **Appendix 1** (Arjen Wals) and **Appendix 2** (Maartje Langeslag) for the full list of questions. The interview with Maartje Langeslag was conducted in Dutch, while Arjen Wals was in English.

2.3.2 Interview Arjen Wals

Arjen Wals is a professor for Transformative Learning for Socio-ecological Sustainability. He has worked in the field of EE for 25 years and gained much experience in that time. Additionally, he got many contacts in these 25 years, also regarding the evaluation of EE. To get more insights into EE, we needed to understand learning objectives of EE, potential indicators of behaviour change from an EE intervention, and evaluating methods in EE. The interview with Arjen Wals was purposed to achieve more understanding and to get more insights. The interview took place on the 23rd of September through Skype, since he was as mentioned above in Sweden. We conducted this interview in the beginning of the project. The interview guide can be found in **Appendix 1** and the transcript of the interview is in **Appendix 4**.

2.3.3 Brainstorm session 1

On the 4th of October we conducted a brainstorm session to come up with our own ideas related to tools which can be used by teachers for the final method. Answering subquestion 1 resulted in some determinants for behaviour. For every one of these determinants we needed tools to measure them. To come up with tools we planned this brainstorm session. The team members first wrote down their ideas related to every determinant by themselves and after approximately one hour every team member presented the own ideas. Afterwards we had a discussion about the ideas, and then merged the overlapping and selected the useful ideas.

2.3.4 The meeting of Werkgroep Zwerfafval in Utrecht

This scheduled meeting was conducted in Utrecht at October 6th 2016, 13:30-16:00, initiated by Werkgroep Zwerfafval. This meeting mostly involved representatives of NME centres and other people involved in waste reduction through education. In this meeting we gave a presentation, where we first gave a small summary about what we were doing and at the end we let them have a discussion about our established determinants and tools. In this discussion we first explained for every determinant a few tools. After our explanations, they had a discussion about the feasibility of the different tools we came up with for every determinant.

2.3.5 Brainstorm session 2

This second brainstorm session was conducted on the 7th of October, to think about our own ideas related to indicators which can be used by teachers for the final method. For every determinant we needed indicators to measure these determinants. To come up with indicators, we planned this second brainstorm session. Every team member first wrote down their ideas by themselves and after approximately one hour every team member presented their ideas. Afterwards we had a discussion about the ideas, and then merged the overlapping and selected the useful ideas.

2.3.6 Interview Maartje Langeslag

On the 12th of October we had an interview with Maartje Langeslag, who is a programme author for the NME. Currently she is busy with making adjustments for the Zwerfafval lesson. NME centres design the WRLs as well as other EE programmes, as mentioned above, they also make adjustments to the current WRLs. There needs to be reason, why a WRLs is rewritten. Besides we want to know more about how evaluation and monitoring should be done. Thus, the main focus of this interview was on reasons behind changing the WRLs, evaluating WRLs and how evaluating could be done. The interview guide can be found in **Appendix 2** (Dutch) and the transcript of the interview is in **Appendix 5** (Dutch).

2.3.7 Questionnaire for a teacher

On the 12th of October we send a questionnaire to two teachers from one school. We only send the questionnaire to two teachers, since we only knew from those two teachers that they had done the lesson in group 7 & 8 last year. We first wanted to do an interview, but an interview was not possible for the teachers. Consequently we made the decision to send a questionnaire. The teachers are the persons who will use the monitoring method. Thus, getting information from a teacher is useful. To support and strengthen our idea regarding the objectives of a WRL, a questionnaire was sent. In this questionnaire the main focus was on the effectiveness, time management, monitoring methods and suggestions from their side, regarding the WRLs. We only send the questionnaire to teachers who had experience with a WRLs in group 7 & 8, because this teachers could talk about their experiences regarding the WRLs. After sending the questionnaire, we got a response from one teacher. The questionnaire can be found in **Appendix 3** (Dutch) and the response of this questionnaire can be found in **Appendix 6** (Dutch).

2.3.8 Subquestion 1

What determinants of behaviour should be addressed in WRLs? This question was important to answer to know how behaviour is shaped and therefore what needs to be changed to change finally behaviour. Consequently, this question was aimed to find out what needs to be monitored, to know how effective the WRL was. The question was mostly answered by a literature study, which was mainly focussed on existing behavioural models, the weaknesses of the behavioural models and about shaping behaviour. After examining and using the literature and the provided information on the three WRLs, some determinants were determined. Also knowledge gained through the interviews with Arjen Wals and Maartje Langeslag were used to define some determinants. In the interviews with Arjen Wals and Maartje Langeslag, questions were asked about steps that can be reached in a short time course, like a WRL. When this subquestion was answered, the gained knowledge was used to answer subquestion 2.

2.3.9 Subquestion 2

What are indicators for measuring these determinants? This question was partly answered by a literature study and partly by brainstorm session 2. In the literature study the focus was on the scientific knowledge of regarding a good indicator and where the focus should be on. Subsequently, we used our own knowledge and suggestions, gained through brainstorm session 2 to transform the determinants in subquestion 1 into indicators.

2.3.10 Subquestion 3

What tools can be used by teachers to monitor these indicators? This question was answered to help on how the developed indicators (subquestion 2) will be assessed by the possible tools would come up with. First, an outline of literature related to monitoring methods in the field of EE is given. Also knowledge gained through the meeting of Werkgroep Zwerfafval in Utrecht, brainstorm session 1, the questionnaire with the teacher and the interviews with Arjen Wals, Maartje Langeslag were used. In the interviews we asked questions about the interviewees ideas, thoughts and suggestions related to a monitoring method for WRLs. After that, we had a closer look on the feasibility and motivation for teachers to use such a monitoring method. That closer look we got with the help of literature, attending the Werkgroep Zwerfafval in Utrecht and the interviews. At the end, we have discussed the results of the brainstorm session we conducted ourselves.

2.3.11 Main question

When the subquestions were answered, we used the information we got to make a monitoring method for the WRLs.

3. Results

In this chapter, the results are described per subquestion in a chronological order. The chapter names are given a name related to the subquestions.

- **Chapter 3.1** Determinants of behaviour: *What determinants of behaviour should be addressed in WRLs?*
- **Chapter 3.2** Indicators for these determinants: *What are indicators for measuring these determinants?*
- **Chapter 3.3** Tools to measure the indicators: *What tools can be used by teachers to monitor these indicators?*

3.1 Determinants of Behaviour

Behaviour is a complex phenomenon and not completely understood by now (Bamberg & Möser 2007). EE wants to promote pro-environmental behaviour and change therefore behaviour (Hungerford & Volk 1990). Unfortunately behaviour is hard to measure (Maartje Langeslag). To design EE lessons and to evaluate their success, the determination of human behaviour is helpful to understand, how behaviour is determined in humans. In this project the main focus is on three Dutch WRLs that target waste reduction as an outcome. Their learning objectives (**Box 1**) do not just focus on a behaviour change, but also on determinants of behaviour that are necessary to adjust to change the behaviour finally. The effectiveness of these lessons are not evaluated by now. To set, which determinants of behaviour are important to focus on in an evaluation, here different models of behaviour are presented as well as some further possible determinants, that are partly discussed as missing points of the models. Also, the interviews with Arjen Wals and Maartje Langeslag are taken into account. Finally, the selection of determinants is set on which there will be a focus within the evaluation system for these lessons.

Box 1: Learning objectives of the selected WRLs

As mentioned in the introduction, the focus of this project is on three programmes of the WRLs and their evaluation is of much interest. In general the goals of these WRLs are that the pupils collect litter afterwards, use less packaging, do not produce litter and separate waste.

In particular the programme of De Klieners wants the pupils to get motivated to participate in that WRL. More motivation can lead to more knowledge and comprehension about garbage, to learn to feel responsible for the environment and to develop an attitude to not produce litter and to separate waste.

In the programme Zwervend Afval the pupils should get an insight into the problem of waste and litter as well as they get aware of their own contribution to that problem.

In the third programme of a WRL, Zwerfafval, the focus is mainly on cleaning the neighbourhood, to investigate the collected waste and to learn more about that topic. Consequently, also here the focus is on knowledge of the issue and on awareness about the waste and litter problem.

3.1.1 Behavioural Models

The easiest behavioural model is the *information deficiency model.* This model presents a linear relationship between more knowledge about the environment to more awareness. Also a linear relationship between more awareness, to more environmental friendly behaviour is presented (Hungerford & Volk 1990; Kollmuss & Agyeman 2002). The learning objectives for EE defined on the Tbilisi Intergovernmental Conference in 1977 already present more goals than just knowledge to reach a behaviour change. These goals were: awareness, sensitivity, attitudes, skills and participation (Hungerford & Volk 1990). According to these goals there is more necessary to reach a behaviour change than just knowledge and awareness.

The *Theory of planned behaviour* proposes that intentions underlie reasoned choices. These intentions should be affected by attitude, subjective norms and perceived behavioural control. Socio-demographics, general beliefs and values have rather an indirect effect through the direct effect. Thereby subjective norms presents the expectations about the actions of others and their values. The perceived behavioural control means the expectation about your own skills to manage something as well as external factors that

might prevent your action (Steg & Nordlund 2012). The *Theory of planned behaviour* is supported to a certain extent by the study of Bamberg (2003).

The *Norm activation model* draws behaviour more in dependence of situation variables like problem awareness, ascription of responsibility, outcome efficiency and self-efficiency. Summarized these are personal norms that can differ in different situations. The *Value-Belief-Norm theory of environmentalism* is related to the *Norm activation model* but sees the situational factors in a relationship with own values and the ecological worldview (Steg & Nordlund 2012).

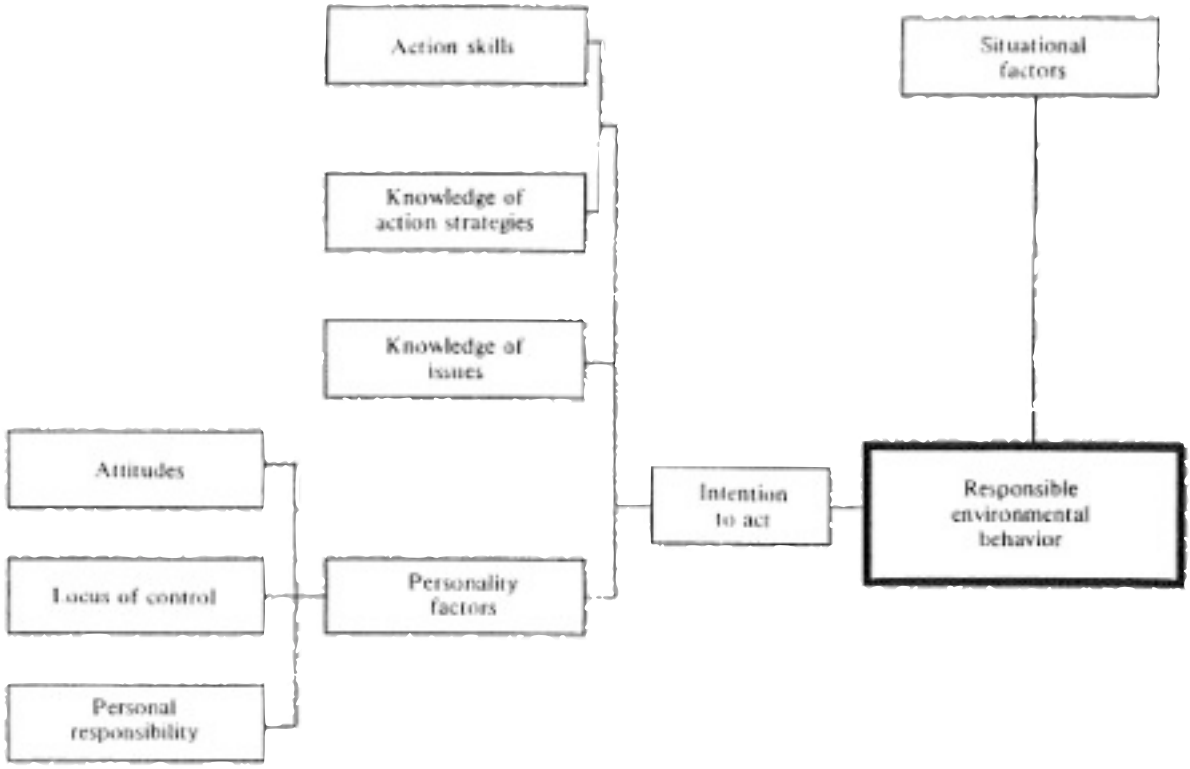

Figure 1: The *Hines Model of Responsible Environmental Behaviour* (from Hungerford and Volk 1990). Based on a meta-analysis, this model shows determinants that affect responsible environmental behaviour. Next to situational factors, mainly the intention to act shapes behaviour. The intention to act results from different factors like knowledge, skills and personality factors.

Finally, the *Community-based-social-marketing* holds barriers more responsible for missing pro-environmental behaviour. The approach of the *Community-based-social-marketing* model starts with an identification of the barriers to the desired behaviour. Considering these barriers, exactly one behaviour should be chosen that wants to be promoted. To promote that behaviour, a WRL needs to be created that surmount the difficulties to that behaviour. After a first try of that WRL, evaluation is needed (McKenzie-Mohr 2000).

Two meta-analyses of environmental friendly behaviour in the 1980s and in 2007 tried to analyse the determinants for pro-environmental behaviour more (Hines et al. 1987; Hungerford & Volk 1990; Bamberg & Mörser 2007). The first meta-analysis (**Figure 1**) was already different from the already presented models. This meta-analysis in **Figure 1** works with the same intentions like the *Theory of planned behaviour* but does not directly contain the subjective norms. While next to attitude and perceived behavioural control respectively locus of control there are many more factors included. Similar to the *Norm activation model*, also situational factors are included, but responsibility, outcome efficiency and self-efficiency are not seen as situational factors. The own values and the ecological worldview of the *Value-Belief-Norm* is not included here at all. While barriers of the *Community-based-social-marketing* are part of the Locus of control, the situational factors and action skills.

The meta-analysis of Bamberg and Möser (2007) gives more insights into determinants of behaviour (**Figure 2**, Bamberg & Mörser 2007). This model even presents its own limitation. The behaviour can still not be completely

explained by the range of factors given as indicated by the numbers of errors. These numbers are never equal one when the numbers for one determinant of behaviour are summed up (**Figure 2**). Other possible important factors can still rely on moral norms and on cultural background (Bamberg & Mörser 2007). Regarding these missing factors and a comparison with the models presented before, the subjective norms of the *Theory of planned behaviour* are contained by social norms. The own values and ecological world views of the *Value-Belief-Norm theory* are partly contained in the internal attribution, the feelings of guilt and the moral norms. The action skills and knowledge of action strategies of the *Hines Model of Responsible Environmental Behaviour* (**Figure 1**, Hungerford & Volk 1990) are missing.

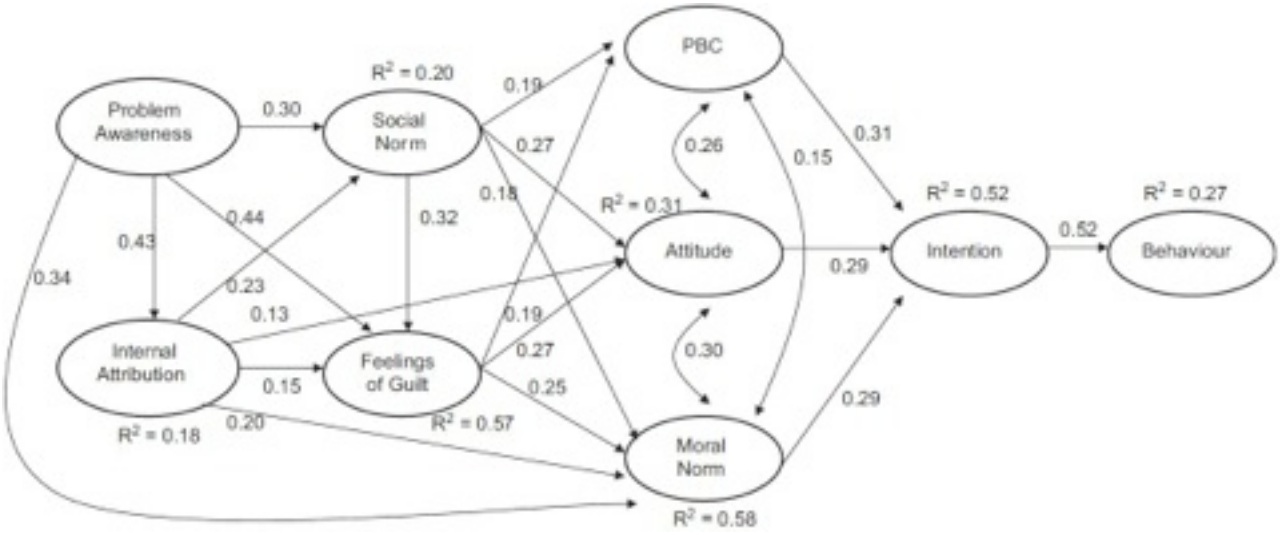

Figure 2: *Model for Psycho-Social Determinants of Pro-Environmental Behaviour* of Bamberg and Möser (2007). Based on pooled random-effects correlations, PBC = perceived behavioural control, single-headed arrows = standardised path-coefficients; double-headed arrows = correlations, R^2 = explained variance.

3.1.2 Practicing, habits and enjoyment

According to the six presented models, there is no perfect model to explain behaviour and changing behaviour in pro-environmental behaviour. Kollmuss & Agyeman (2002) discussed that also practicing could be important to make the pro-environmental behaviour a habit. Also Ehrhardt-Martinez (2011) presents habits as an important driver for environmental issues. Wood et al. (2005) showed that behaviour with disrupted habits and behaviour are independent of habits based on intention. Intention was not enough to explain why habits changed in the study of Wood et al. (2005). Consequently, this study also supports the importance of habits to explain behaviour. Regarding children, parents have a central role in creating habits (Scaglioni, Salvioni, & Galimberti 2008). Therefore habits of the children and the parents can be important to explain the behaviour of children. Nevertheless, within the short time of a programme like the WRL, the feasibility to change successfully habits is doubtable.

If behaviour is not obligatory, enjoyment plays also an important role regarding the intrinsic motivation to practice an activity in long term (Lindenberg 2001). Also Hamari, Sjöklint & Ukkonen (2015) found that enjoyment is an important factor to raise the more environmental friendly behaviour. In their study the knowledge about sustainability rather just raised the awareness but not a change in behaviour while enjoyment changed the behaviour. For pupils especially, the fun in joining a social network is important, also regarding pro-environmental behaviour (Chawla & Cushing 2007). Consequently, a social network makes social norms even a more important factor for the behaviour of pupils.

3.1.3 Interviews with Arjen Wals and Maartje Langeslag

In the interview with Arjen Wals, different factor were mentioned that can be changed in a short term course like a WRL. Factors like knowledge, understanding of technical things related to environmental issues, reflection of the own role, awareness and feeling empowered to change things were at the forefront of his thinking. According to the models of determinants of behaviour these milestones are related to knowledge of issue, knowledge of action strategies, personal responsibility, moral norms, problem awareness, worldview, own values, outcome efficiency, self-efficiency and perceived behavioural control. Consequently, also his view is in line with the presented behavioural models. He stressed the

different domains related to thinking (head), feelings (heart) and doing (hands). All these domains should be addressed in the monitoring.

In the interview with Maartje Langeslag, knowledge, attitude, empowerment and awareness were mentioned as important aspects for behavioural change. Maartje Langeslag used the same words as the above mentioned models.

3.1.4 Conclusion

Regarding the presented behaviour models, the insights of the interview with Arjen Wals and the learning objectives of the WRLs (see **Box 1**), the most important determinants regarding the evaluation of WRLs are defined. The first determinant is *knowledge of the issue* like claimed in *Hines Model*, postulated by Arjen and Maartje and given as learning objective in the selected WRLs. This insight acts as basis to understand the responsibility of our behaviour. As second important determinant of behaviour the *awareness* needs to be mentioned. *Awareness* was also part of the interviews with Arjen Wals and Maartje Langeslag, as well as in the *Norm activation model* and in the model for Psycho-Social Determinants of Pro-Environmental Behaviour. Furthermore *awareness* is also part of the selected WRLs. The role of social interactions of pupils should also taken into account (Chawla & Cushing 2007), for example what pupils expect to be a *social norm* in their environment. The knowledge about pupils' development of *attitude* to behave pro-environmentally and about their feelings regarding *empowerment* to behave pro-environmentally is important. The feelings of *empowerment* we define as feeling equal to make a change in the waste problem. *Attitude* and *empowerment* were also mentioned in the interviews with Arjen Wals and Maartje Langeslag. *Attitude* is also mentioned in the learning objectives of our selected WRLs and in the *Theory of planned behaviour*, the *Hines Model* and the *Model for Psycho-Social Determinants of Pro-Environmental Behaviour*. Feeling *empowered* is mainly based on the knowledge of action strategies and action skills (*Hines Model*), respectively outcome-efficiency and self-efficiency (*Norm activation model*). Finally, even when all of these parameters are fulfilled, there is the possibility that the following determinants avoid a behaviour change: *enjoyment*, already long lasting habits that are difficult to overcome with new behaviour or just missing *practicing* of the new activity. Therefore less belief in having the skills can hamper pupils in changing their behaviour. Thus, *enjoyment*, *habits* and *practicing* are also important to consider as important factors for reaching behaviour change after the WRLs. Unfortunately, *habits* and *practicing* are difficult to capture appropriately in a WRL. Consequently, based on this conclusion the indicators will be *knowledge*, *awareness*, *attitude*, *empowerment*, *social norms* and *enjoyment*.

3.2 Indicators for these Determinants

The previous chapter explored the relevant determinants of behaviour. Although *behaviour* itself is not a determinant, *behaviour* is important to evaluate since behaviour change is the ultimate goal of the WRLs. Thus, we will also focus on *behaviour* regarding this subquestion and the next subquestion, although behaviour is not a determinant. To repeat, the determinants were *knowledge*, *awareness*, *attitude*, *empowerment*, *social norms*, *behaviour* and *enjoyment*. In this section of the report, we will discuss the different types of indicators, which can be used for measuring the determinants and *behaviour*. First different types of indicators found in literature will be explored. Then the gained knowledge in the literature about indicators will be summarised, in which a combination of the different theories about the indicators will be given. Subsequently, we will develop our own indicators based on brainstorm session 2, the established determinants in the chapter before and the theory about indicators.

3.2.1 Different types of indicators

In the following paragraphs the different kind of indicators given by the North American Association for Environmental Education (NAAEE), Marchement, Binkley, Organisation for Economic Co-operation and Development (OECD) and Ireland will be discussed.

3.2.1.1 Indicators as discussed by NAAEE

According to NAAEE (2002), indicators for measuring EE and environmental literacy can be categorized into three categories. The first one is interconnections. Which are elements that combines the knowledge about ecological systems, processes, personal wellbeing and healthy communities? These elements are environmentally sustainable and economically prosperous. The second category is diversity. Diversity involves considering and honoring different

environmental and social recognizable perspectives of worldviews on regional, cultural and global level. The third one is responsibility/citizenship, which focusses on the own responsibility of a person. These three categories incorporate and investigate evaluation skills and actions which enable pupils to understand and develop abilities in adapting change and emergence in society.

The NAAEE (2010), stresses the need to measure these indicators for identifying, evaluating and proposing environmental issues. These indicators require knowledge of environmental systems, sociopolitical systems and strategies for addressing them. Besides, the dispositions towards the environment in terms of interest, sensitivity, locus of control, responsibility and intention to act are of importance. The context in which an environmental issue occurs, can cause people to respond differently about solutions for similar issues. In **Figure 3**, the need of different types of contexts can be seen, for different types of competencies. Since context can differ locally, regionally and globally. When the context is identified the different types of competencies can be linked to that context. The way these competencies are demonstrated can be seen in the **Figure 3** below. To conclude, knowledge, dispositions and competencies can be jointly expressed in the behaviour of a person.

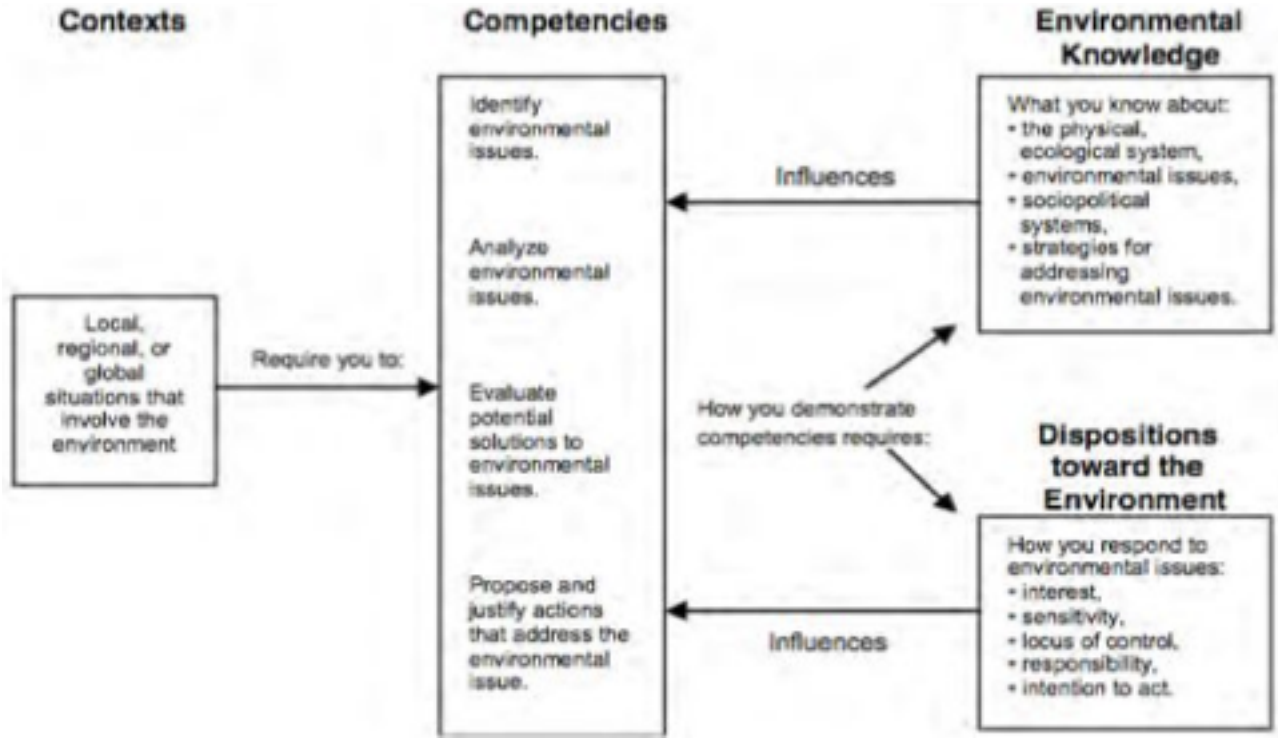

Figure 3: Assessment framework of the NAAEE

3.2.1.2 Indicators as discussed by Marchement, Binkley and OECD

The indicators, according to Marchment (2008), can be explained as statements of attitudes, skills, knowledge, values or behaviour. These statements can be used to assess or evaluate an intervention. In essence, this statement gives insight in the development level of the pupil. Evaluation needs to measure high level attitudes, skills, and knowledge. This evaluation is largely performance-based and incorporates the adaptability and ability to handle novel unpredictable situations. Evaluation should also make sure that pupils apply content, knowledge, critical thinking, problem solving and analytical tasks (Binkley et al. 2012). OECD (2011) emphasises that assessment of skills and competencies of pupils should focus on analytical skills; ability to integrate what they learn, creativity; ability to work collaboratively, oral and written expressions skills.

3.2.1.3 Indicators as discussed by Ireland

To achieve a complete evaluation of the waste reduction lessons, the indicators for evaluating EE should cover the domains of cognitive (thinking or knowledge and understanding), affective (feelings or attitudes and values) and psychomotoric (doing or skills and processes) indicators (Ireland 2013). In **Table 1** the different kind of indicators are

explained more extensively, which are structured around the cognitive, affective and psycho-motoric learning indicators (Ireland 2013). We can conclude, based on the table, that the determinants, *knowledge*, *awareness* and *social norms* are working on the cognitive part. While *attitude*, *empowerment* and *enjoyment* are on the affective part and finally the *behaviour* itself is the psycho-motoric domain.

Table 1: Three different domains of behaviour for each with three indicators

Cognitive	Affective	Psycho-motoric
1. Remember and understand	1. Become aware	1. Perceive and plan (identify)
2. Apply and analyze (information and content)	2. Response (ethical approach)	2. Take action
3. Evaluate and create	3. Value (open-mindedness)	3. Adapt and originate

Ireland (2013) also identified six major ways of categorising and describing indicators and learning outcomes from EE to the pupils. The six key organising ideas are:

1. Understanding ecological principles (ecological foundations), processes and systems
2. Environmental sensitivity (empathy and connections); building identity
3. Understanding systems and issues; ethical mind; be aware of develop and discuss attitudes and values
4. Investigation and evaluating knowledge and skills
5. Action competency
6. Social responsibility; citizenship

3.2.2 Summary of the theory about indicators

To combine the indicators mentioned above we are using the three domains of Ireland (2013): cognitive, affective and psycho-motoric. The other indicators of other authors can be added in those three categories, which you can see in **Table 2**.

Table 2: List of indicators based on the domains of Ireland (2013)

Three domains of Ireland (2013)	The focus of the indicators
Cognitive thinking or knowledge and understanding	1. Indicators must focus on content (Binkley et al. 2012 and Marchement 2008). 2. Indicators must address different types of context (global, local, regional) (NAAEE). 3. Pupils should be able to identify, analyse, evaluate and propose environmental issue (NAAEE). 4. Pupils should be able to understand ecological principles (ecological foundations), processes and systems (Ireland 2013). 5. Pupils are able to make connections between different environmental issues (NAAEE).
Affective feelings or attitudes and values	1. Pupils must be able to react on statements regarding attitudes and values (Marchment 2008). 2. Pupils must develop / discuss attitudes and values (Ireland 2013). 3. Pupils should address environmental sensitivity (empathy and connections) and build an identity (Ireland 2013). 4. Pupils must have the feeling that they are responsible (NAAEE).
	1. Indicators should include statements of skills (Marchment 2008).

Table 2: List of indicators based on the domains of Ireland (2013)

Three domains of Ireland (2013)	The focus of the indicators
Psycho-motoric doing or skills and processes	2. Pupils can conduct critical thinking, problem solving and analytical skills (Binkley et al. 2012). 3. Pupils are able to integrate what they learn, are creative, are able to work collaboratively and have oral and written expressions skills (OECD 2011). 4. Pupils have an action competence (Ireland 2013). 5. Pupils are able to investigate and evaluate knowledge and skills (Ireland 2013).

3.2.3 The indicators

By using the theory about indicators and the findings on determinants in subquestion 1, we developed, with the help of a brainstorm session, some indicators for evaluating the WRLs. To repeat, the determinants were *knowledge*, *awareness*, *attitude*, *empowerment*, *social norms* and *enjoyment*. The determinants and related indicators are listed below in **Table 3**. Also indicators for *behaviour* are established.

Table 3: The indicators based on the determinants and behaviour

Determinants and behaviour	Indicators
A. Knowledge	1. The pupil can define types of waste and packages based on the biodegradability and give examples 2. The pupil can classify waste for its separation 3. The pupil can describe the feasibility to use waste again 4. The pupil can determine the advantages and disadvantages of recycling 5. The pupil can review how waste flows in the environment 6. The pupil can determine the effect of different kinds of waste in their neighbourhood 7. The pupil can come up with solutions for waste problems in the neighbourhood
B. Awareness	1. The pupil indicates littering negatively 2. The pupil is able to identify the ecological problem of waste 3. The pupil perceives a high amount of litter as a problem 4. The pupil is able to identify irresponsible waste behaviour
C. Attitude	1. The pupil wants to make a change regarding the waste problem 2. The pupil experiences negative feelings in the presence of litter 3. The pupil desires to learn more about the waste problem
D. Empowerment	1. The pupil can come up with own ideas to solve a part of the waste problem 2. The pupil has own experience(s) with actions that solve the waste problem 3. The pupil feels that its actions can make a difference
E. Social norms	1. The pupil encourages the desired behaviour of others. 2. The pupil discourages undesirable behaviour of others. 3. The pupil makes the desired choices despite contrasting external influences 4. The pupil expects others to care about the waste problem

Table 3: The indicators based on the determinants and behaviour

Determinants and **behaviour**	**Indicators**
F. Behaviour	1. The pupil separates waste 2. The pupil chooses products with less packaging 3. The pupil picks up litter 4. The pupil does not produce litter 5. The pupil chooses products that can be reused
G. Enjoyment	1. The pupil has a positive association to the WRL 2. The pupil is happy that he/she can help in the waste problem 3. During the lesson the pupils participate actively

3.3 Tools to measure the indicators

To establish a monitoring method, we first used a literature study to see how the evaluation of EE and WRLs could be monitored. The determinants and *behaviour* –already explored in subquestion one– will be used to discuss different kinds of methods, which are possible to be used in monitoring the WRLs. First, we will explain the existing tools in literature, which are related to monitoring methods in the field of EE. Subsequently, we will elaborate on the knowledge given by Maartje Langeslag and Arjen Wals. Then, we will have a closer look on the feasibility and motivation for teachers to use such a monitoring method. At the end, we will present the tools, who can be used for evaluating the different determinants. These tools are based on the interviews, literature, the inspiration of seminar methods, internet sources and our own brainstorming.

3.3.1 Existing systems

Several studies are conducted related to monitoring EE. For example, the study of De Lavega (2004), which will be discussed later, already established a model for EE monitoring method. This study assessed the effectiveness of EE in the curriculum, regarding the awareness, knowledge and attitude of several groups, including pupils using surveys. Besides, some other existing monitoring methods are already integrated within this existing EE system, while others are established independently (De Lavega 2004; Carleton-Hug & Hug 2010; Somwaru 2016). Since there are already different methods in place, various good aspects of these existing methods will be discussed.

3.3.1.1 Outcome and Process-Based Monitoring

The already existing monitoring methods of the EE are identified to mainly focus on the outcome. This outcome is the end result of the WRL which are mainly focused on a change of awareness, knowledge, and attitudes of the pupils (UNICEF Unknown; De Lavega 2004). Besides, there are indications that the *attitude* of the pupil is more influenced by the teachers instead of the parents. A significant effect by the teacher means that the outcomes of EE could be triggered by providing appropriate implementations and approaches given by the teachers. Since all teachers are on different levels of structure and enthusiasm for example. Therefore, the monitoring of the different implementations and approaches of the teacher would also be useful. Nevertheless, the presence of an effect of the parents and the peers on the behaviour of each pupil should be kept in mind (De Lavega 2004).

To establish a good method in monitoring the effectiveness of EE, there should be also a focus on the process, instead of only the outcome. Thomson, Hoffman & Staniforth (2003) indicated that the outcome is still a major focus of most evaluations, while the first focus should be on the process. The importance of the process part of the implementation of EE results from its influence on the outcome. Thus, if the process is not good, the desired outcome cannot be achieved. Therefore, the established monitoring method should first have a focus on the *process* and then the outcome. Consequently, we have decided to also provide a tool to monitor the *process*. With the knowledge gained in **chapter 3.2** we developed some corresponding indicators for *process*, which is shown in **Table 4**. Besides the indicators of the *process* are psycho-motoric, just as *behaviour*.

Table 4: The indicators based on process

H. Process	**1.** The lesson material is sufficient for reaching its learning objective **2.** The lesson is executed according to plan **3.** The pupil reaches the learning objectives of each lesson part **4.** The time in the lesson is efficiently used **5.** The lesson is interactive **6.** Teachers are enthusiastic about the WRL

3.3.1.2 Different approaches for monitoring the process

Focusing on the method that will be established in this project, we can focus on two main parts –as mentioned above. The progress of implementing lessons (*process*) and direct (short-term) effect to pupils receiving the lessons (outcome). The two focuses will be expanded per approach. To monitor the *process*, some questions are possible to ask: 'what is the focus of the lessons', 'which services are provided', 'are there more lessons after the first one' or 'what is the response from pupils (Thomson, Hoffman & Staniforth 2003)?'

To obtain such a focus, a direct observation of the teacher can be conducted. The method provided can contain a list of confirmations related to the focuses that will be addressed to the teacher. To make the method handy to use, the questions can be provided as multiple-choice. Multiple-choice can make the classification clearly and avoid the possibility of receiving multiperspective answers. Besides, an open question can be provided regarding the opinion of the teacher on the implemented lesson. Somwaru (2016) also advised the use of a logbook (in which all activities and improvements concerning the waste reduction are recorded). This logbook can be an information source (if relevant or already suggested in the guideline of the lesson) to indicate the process of the EE implementation, regarding either the process or the outcome.

3.3.1.3 Different approaches for monitoring the outcome

Thomson, Hoffman & Staniforth (2003) came up with two approaches to monitor the outcomes: surveys and observation. By giving a survey, the pupils can answer a list of questions for example regarding their *awareness*, *knowledge* and *attitudes* about waste. To perform the survey, a representative sample of pupils receiving the lessons (a minimum of 40%) is suggested. The survey can also give the comparison of such focuses before and after experiencing lessons (if relevant and possible) (Somwaru 2016). The checklists and rating scales can be an attractive technique to be included into the survey to monitor the outcome (UNICEF Unknown). Besides, observation can be conducted to test the presence or absence of a number of behavioural criteria. Also interviewing pupils is a possibility to evaluate different behavioural factors (Farmer, Knapp & Benton 2007). Nevertheless, also other, more creative methods for evaluation should be taken into account. Thomson, Hoffman, & Staniforth (2003) mentioned a possible example of using student art work or a creative form of feedback as monitoring method, for example by designing postcards or making a photo project. In addition, some instruments and items suggested by Bennett (1984) for either output or process are listed below.

- Pencil and Paper test of Achievement*
- Performance test of Achievement
- Surveys*
- Interviews*
- Observational Instruments
- Artefacts*
- Unobstructive Measures*
- Using Multiple Measures

* Indicates that the method is also possible for the process

3.3.1.4 Contextual Parameters

To identify why a certain outcome of the evaluation might take place, also contextual parameters need to be evaluated. Besides, we also need to have a concern about the time duration since a teacher in the questionnaire also stated that teachers do not have a lot time. A longer time spent on monitoring will consequently affect the evaluation itself. Some studies also mentioned that the longer and time consuming an evaluation is, the bigger the change of a decreasing effectiveness is (Antonio, Lare, & Waters 2006; Nelson 2012). Thus, the effectiveness of the monitoring method could be increased when the duration is shortened.

3.3.2 Interviews with Arjen Wals and Maartje Langeslag

Within different interviews different ideas for the content of the monitoring system came up. Arjen Wals for example suggested a mind map for assessing the gained knowledge of the lessons or using emoticons to give the pupils a tool to explain their feelings about the problem. These both ideas are mainly related to "head" and "heart" of the pupils. To assess the "hands" an idea of Arjen Wals was to let the pupils report the own waste reduction at home. Maartje Langeslag said that in Zwerfafval the pupils already had to answer a few questions in a survey, before and after the WRL. These answers were not monitored yet.

3.3.3 Limitations and Settings for the method

To establish the whole body of the monitoring method, we already determined which determinants are the general focus of the already existing WRLs. Then, we developed indicators that are appropriate to measure these determinants, *behaviour* and *process*. *Process* and *enjoyment* will assess how the WRL is performed considering the process aspect, while the rest will assess the outcome. The determinants of *knowledge*, *awareness*, *attitude*, *empowerment* and *social norms* will be addressed by the pupil, while *behaviour*, *process* and *enjoyment* will be addressed by the teacher.

To expand these points into the monitoring method, we will use different tools that are applicable for different sort of indicators. Focusing on the process aspect, we will use a *survey*. This *survey* includes a checklist for the teachers. Several focuses can be addressed to see the process:

1. The time provided for the lessons
2. How attractive the teacher delivers a lesson
3. The conformity of the implementation of a lesson, related to the instruction provided by the lesson package
4. Difficulties experienced by the teacher during the implementation of a lesson

This *survey* will be mostly used to indicate the outcome aspect as mentioned by Bennett (1984) and Thomson, Hoffman, & Staniforth (2003). The *survey* is intended to be as creative as applicable to reduce the possibility of pupils knowing the aim of the survey and giving as a consequence, an intentionally wrong answers (Silman & Macfarlane 2002). Thus, we like to call our method a *creative survey*. According to David (1992) and Smith & Barker (1999), children find traditional methods such as conventional *questionnaire surveys* either intimidating (since they require a high degree of literacy), inappropriate (since they are often without any context) or boring (since they are no fun). Regarding literature, *surveys* do not take the age of the pupils into account even though age is correlating with the abilities. There are however many other ways children can communicate, such as *drawing*, *photography*, *stories* or *songs* (Alderson 2000; Christensen & James 2000). Such approaches are unfortunately hard to measure since *drawing*, *photography*, *stories* and *songs* need to be interpreted. The way something is interpreted can be different from different persons. Additionally, the interpreter can have expectancies on the results of the evaluation. These expectancies can affect the interpretation and cause an interpersonal expectancy effect (Rosenthal 1994).

The main concern of teachers is how time consuming the monitoring will be. Consequently, the *survey* should not be too time consuming. Other methods that give results of a higher quality, are mostly more time consuming for teachers in implementing and assessing the results (McTighe & Ferrara 1994). A very time consuming method would be therefore a barrier to evaluate or even delivering the lesson. *Surveys* are expected to be less time consuming and easier to assess if we compare the survey to another method, for example discussions (McTighe & Ferrara 1994). As a *survey* can be also implemented in digital form, there is even the possibility to save the time of analyzing the results of the evaluation. Nevertheless, still the accuracy of the *survey* is a matter. According to Silman & Macfarlane (2002), the bias

and therefore the possibility of wrong answers especially exists when the hypothesis of the study is known. Thus, we want to design the *survey* as creative as possible to hopefully reduce the chance of intentionally wrong answers by obviously presenting the aim of the questions. By doing an evaluation based on a *survey*, having data before and after an intervention is handy. In our case the WRLs are the interventions. Consequently, we need also data of the pupils before the intervention. For that reason we decided that our *survey* will be given to the pupils before and after the WRLs. We decided that the assessments should be approximately one month before the WRLs and one month after the WRLs, to enable an evaluation of the lesson when the lesson is given close to the end of the school year.

Unfortunately, *behaviour* is according to NAAEE (2002) hard to measure. Since particular behavioural outcomes may not exhibit themselves immediately. Behavioural measurement has its own shortfall. Thomson Hoffman & Staniforth (2003) stated: "Whereas changes in values tend to occur during or shortly after a programme, it may take longer time for behaviours to manifest themselves. This statement does not only call for a long term approach to evaluation that spans a number of years, but also opens the door to the possibility that some influence other than the programme caused the behaviour". An evaluation of the Dutch Littering programme 2007-2009 also showed that the programme did not achieve the intended goal: a behavioural change in the long run (Hoppe et al. 2013). As time is critical, this knowledge about behavioural change in the long run should be taken into account in the evaluation of the effectiveness of the WRLs.

Nevertheless, the evaluation of the WRL is a kind of behavioural study. In a behavioural study there is always the possibility of an interpersonal expectancy effect (Rosenthal effect) (Rosenthal 1994). Consequently, we need to try to make the evaluation method uniform in its assessment. An observation or discussion for example is difficult to design in a consistent way as the implementation depends on the implementer (Silman & Macfarlane 2002) and the Rosenthal effect originate from subjective conditions (Rosenthal 1994).

3.3.4 Ideas for tools for a method, based on brainstorm sessions

In the first subquestion we defined the determinants. In the second subquestion the indicators, who will show the desired change for the determinants and behaviour, were found. In the third subquestion we dealt up with the background of monitoring and the process. Based on the first subquestion, the second subquestion and the background of monitoring, **Table 5** presents possible tools for monitoring the effectiveness of WRLs. The applicable indicators for each tool can be also found in **Table 5**. Also a figure is presented in **Appendix 7**, where you can see for every determinant the top two of tools, with the related indicators. As sources for tools, we used the literature study, the interviews and our own creativity within the brainstorm. Additionally, to come up with creative ideas for a *survey*, also seminar methods helped us to enhance creativity. On the one hand there is a row of books with different, partly outstanding tools (Grötzebach 2008; Dürrschmidt et al. 2011) and on the other hand also the internet, provides ideas of tools that are not known by everybody (Seiß Unknown; Januszewski & Molenda 2008).

Table 5: List of proposed tools will be used for each determinant

Determinants, behaviour & process	The measured indicators	Tools	Description
A. Knowledge	A2, A3, A4, A5	1. Mind map	The pupil write individually his associations with the word waste in form of a mind map.
	A1, A2, A7	2. ABC-Letter	The pupil lists the alphabet vertically and writes down associations with the word waste for every letter.
	A1, A2, A3, A5, A6	3. Puzzling/ memory	The pupil is given many pictures, then he/she connects two things that are connected within the topic waste. The pupil needs to explain that connection.
	A1, A2, A3	4. Separation game	The pupil gets pictures of waste and need to sort in which kind of bin the waste belongs.

Table 5: List of proposed tools will be used for each determinant

Determinants, behaviour & process	The measured indicators	Tools	Description
B. Awareness	B1, B2, B3, B4	1. Drawing/comic/ picture /collage/ writing	The pupil gets inspired by waste-related keywords, or by question 'what is your impact' to make a creative drawing/ comic/picture/collage or a writing.
	B1, B2, B4	2. 3 lies/1 truth	Four sentences are presented of which three ones underestimate the problem of waste. The pupil needs to choose, what he/she believes is right.
	B1, B3, B4	3. Order pictures for liking	The pupil gets different pictures with different amounts of waste. An order should be made according to how much the pupil likes the pictures.
C. Attitude	C2, C3	1. Fishing net and pond	The pupil is given a drawn fishing net and a pond. The pupil can indicate in the fishing net, what he/she takes home from the lessons? And in the pond, what he/she leaves behind in the classroom.
	C1, C2	2. Statement game	The pupil decides if he/she agrees or disagrees with the given statements
D. Empowerment	D1, D2, D3	1. Questionnaire	The pupil is asked if he/she has a feeling that he/she can make a difference in the litter problem and how?
	D1, D2, D3	2. Flower power	The pupil is asked if he/she can think about something that can be done by the pupil him-/herself about the problem and to fill the ideas into the leaves of a flower. Furthermore, the pupil is asked, if he/she knows ways to conduct his/her idea and what (tool) is necessary for the action and to fill that tool into the roots of the flower.
E. Social Norms	E3, E4	1. Spider web	The pupil gets a picture of a spider web with different values/norms in the corners that can be important for persons. Within the spider web there are different small spider webs in so that there are stages. The pupil needs to indicate what he/she thinks is how important for the persons that are close to him/her.
	E3, E4	2. Tree of social norms	The pupil is provided with a tree on paper. In the crown the pupils write what he/she expects, regarding how people behave regarding waste and in the roots they can indicate what the most important values are behind that behaviour.
	E4	3. Asking for the neighbourhood's perspective regarding litter in the neighbourhood	The pupil is directly asked, what the people in the neighbourhood of the pupil thinks about litter in their own neighbourhood.

Table 5: List of proposed tools will be used for each determinant

Determinants, behaviour & process	The measured indicators	Tools	Description
	E4	4. Write one word concept on paper related to 'appropriate behaviour'	The pupil is provided to give a simple word to express what behaviour in the neighbourhood is appropriate to be maintained.
F. Behaviour	F2, F5	1. lunch boxes and bottles	The teacher counts how many pupils have their lunch in plastic bags and how many in a lunch box
	F1, F2, F4	2. checking for recycling	The pupil observes if the waste is in the right bin.
	F2, F4, F5	3. collecting snack waste	The pupil collects snack waste in a box & counts or weighs the waste per pupil in the end of the week + amount of plastic waste in comparison to overall waste collection
	F2, (F4)	4. collecting litter	The pupil collects litters around school, separates the litter and weighs the litter (photo project, building monster, presenting the results to neighbourhood)
G. Process	G1, G2	1. Asking the pupils	The pupil indicates if he/she likes the lesson (scale, smiley, etc.)
H. Process	Not recommended	1. Checklist for the teacher	The teacher checks for: a) attractive provision of a lesson; b) time duration of the lesson; c) participation of pupils (scale)
	H1, H2, H3, H4	2. Learning wheel	The pupil is provided a circle with segments for each WRL day, inner circle "What did you learn today", outer circle "what do you want to learn more about / What did you not understand?"
	H5, H6	3. Tips and tops pupils	The pupil gives his/her remarks about the lessons
	H1, H2, H5, H6	4. Tips and tops teacher	The teacher gives his/her remarks about the lessons
	H1, H2, H3, H4, H5, H6	5. Class visitation by NME persons	The representatives of NME go to schools to see how teachers are acting by teaching a waste reduction lesson
	H3, H5, H6	6. Focus group discussion	The pupil discuss useful ideas, different viewpoints, new insights, improving question design

4. Conclusion, Discussion & Limitations

We took three steps (the 3 subquestions) to come to an answer to the main question "which method can teachers use to monitor the learning objectives of waste reduction lessons in group 7 & 8?". In this chapter the answers to the subquestions will first be summarized in **4.1 Conclusion**. Besides the answer to our main question will be given. In **4.2 Discussion** we will discuss, based on the answers of the sub and main question what our final method will look like and why. Since we are going to discuss why certain tools and indicators will be used or not be used, new thought and literature will be presented to explain. At the end, the limitations of our project will be presented.

4.1 Conclusion

In the beginning of this project, we investigated the determinants of behaviour. After the development of determinants, we needed to shape indicators that show a change in the determinants after the WRL. Furthermore, we needed to find tools to measure these indicators.

In the first subquestion, we had a look on the different determinants of behaviour. We found many factors influencing behaviour, but still not all factors are known today. Besides some determinants like habits and practicing are hard to access. Therefore we agreed on the determinants: *knowledge of the issue*, *awareness*, *attitude*, *empowerment*, *social norms* and *enjoyment*. Additionally, also the final *behaviour* change regarding waste and the *process* are interesting.

In the second subquestion a finding was that indicators need to work on the cognitive, the affective and the psycho-motoric domain. These segments are in line with the determinants that were chosen in the first subquestion. *Knowledge*, *awareness* and *social norms* are working on the cognitive part, while *attitude*, *empowerment* and *enjoyment* base on the affective part. Finally the *behaviour* itself and the *process* are in the psycho-motoric domain. For the different determinants different indicators were created that show a part of the desired change in the determinant.

In the last subquestion, we came up with different tools to assess the indicators for each established determinant. The differences between outcome-based and *process*-based evaluation were worked out. Both kind of evaluations were seen as useful to increase the value of the evaluation outcome. Different possibilities for tools were reviewed but regarding the teacher's main constraint, time, a *survey* was chosen for the evaluation, as far as a *survey* is applicable for evaluating tools. To deal with the pitfalls of a *survey*, the ideas for tools were tried to be as creative as possible. In a way that we do not offer the intention of the *survey*. On the same time, to make the evaluation consistent, the possibility of the Rosenthal effect is minimised. As, thus, the survey is not a usual survey, we like to call our survey a *creative survey*. So to answer our main question, a *creative survey* will be the method we will develop for the teachers to monitor the learning objectives of WRLs in group 7 & 8. This survey should be filled in one month before and one month after the WRLs. Some indicators/tools will also be accessed during the WRLs. In the following chapter we will discuss which tools and indicators are most appropriate for the monitoring system of WRLs and why. This will be based on new literature.

4.2 Discussion of the creative survey

Designing a measurement tool requires taking into account reliability and validity. The tool needs to be reliable, which means its results should be consistent in similar situations. Only in that way the results are comparable. The tool also needs to be valid, thus, the tool measures the correct parameter. For the established method in this report, its validity is partly taken into account by carefully deciding on the relevant determinants and the corresponding indicators.

For the different determinants and factors that need to be measured within the creative survey, we presented a variety of tools. To design an appropriate creative survey, the most suitable tools should be discussed. Afterwards one tool per determinant was chosen for our final method. The tools we presented were different in terms of the amount of time required to implement them. Also the amount of indicators that are measured by the tools differ. To monitor the pupils in an efficient way, the application of different indicators in one tool is handy as long as the tool is still reliable and valid. The concept of reliability and validity is used to determine the effectiveness of the evaluation. However, the weakness of this concept is that validity and reliability can only be measured after receiving the data from the evaluation (Morse et al. 2002). Therefore, the extent of validity and reliability of the tools we have offered in this report can only be assessed

after their application. In this section, we will discuss the reasons behind our choices regarding the monitoring system per determinant.

4.2.1 Knowledge

For knowledge we had four different ideas for tools. In our opinion the *mind map* is the best tool as *mind mapping* provides the possibility to use different indicators of knowledge. Regarding the indicators of knowledge, the *mind map* can assess if *the pupils can classify waste for its separation*, if *the pupil can describe the feasibility to use waste again*, if *the pupil can determine the advantages and disadvantages of recycling* and if *the pupil can review how waste flows in the environment*. Finally, *mind mapping* also applies the indicator *the pupil determines the effect of different kinds of waste in their neighbourhood. Mind mapping* cannot be applied to the indicators *the pupil can define types of waste and packages based on the biodegradability and give examples* and *the pupil can come up with solutions for waste problems in the neighbourhood*. The high number of indicators addressed in the mind map makes mind mapping more preferred than the *separation game*. The *separation game* just assessess if *the pupils can classify waste for its recycling*. At the meeting of Werkgroep Zwerfafval in Utrecht, the NME officials who work on the WRLs equally endorsed *mind mapping*. However, the major concern was the consideration of relevancy of this tool for group 7 and 8. Compared to the idea of an *ABC-letter*, the *mind map* is easier to make the pupils come up with more content. In contrast the *ABC-letter* might restricts the pupils to finding one word per letter.

Additionally, according to Novak (1990), the concept of mapping improves teaching and learning of science. Based on Novak's remarks, the potential of the concept mapping as a teaching tool can be grouped into four different ones: as learning strategy, as an instructional strategy, as planning tool and as a means of assessing students' understanding of the concept of science. Based on the last potential, *mind map* is an appropriate tool for testing the knowledge of pupils that participated in the WRLs. Nesbit & Adesope (2006) also found that among the many instructional conditions, settings and methodological features, use of concept maps is associated with increased knowledge retention. Also Abi-El-Mona & Adb-El-Khalick (2008) found that mind mapping enhances the knowledge, although the extent to which *mind mapping* increases knowledge depends on their skills in conceptual understanding.

Concerning these advantages of *mind mapping*, we consider *mind mapping* as a good tool, since *mind mapping* is not as time consuming compared to the *memory* tool. Moreover, the *memory* would be hard to assess in the same way by every teacher, as the written explanation can be interpreted differently. Consequently, the teacher would take the role of an observer and the results of observations are strongly dependent on the observer (Silman & Macfarlane 2002). Besides, interpretations give more space for an interpersonal expectancy effect (Rosenthal effect) (Rosenthal 1994) as explained in **3.3.3**. As also *mind mapping* offers the possibility of interpreting, the explanation of the exercise and the rules for the evaluation of the mind map needs to be very concrete to take care of validity and reliability.

4.2.2 Awareness

Assessment and the role of the teacher plays a role in awareness. The idea about *drawings*, *comics*, *essays* etc. put the teacher in an observer role. Therefore *drawings* etc. are vulnerable for the subjective view and interpretation of the teacher (objective effect) (Silman & Macfarlane 2002) and consequently, for the Rosenthal effect (Rosenthal 1994). The pitfalls of interpretations are important to consider because for every class there is another teacher who is going to evaluate. The possibility that *drawing* can be a plausible tool for evaluation, has been suggested (Mietzel 2002). Nevertheless, the pupils can compare the results of each other and affect the reliability of the evaluation process. Additionally, some pupils can feel inferior about their ability on drawing (Bartel 2016), so for them drawing is not enjoyable.

The idea of *ordering pictures* on a scale has also some shortcomings. For example, the assessment of the order in a statistical programme is possible, but requires that teachers or the NME staff have the requisite knowledge to work with the statistical programmes. A standard programme like for example excel, is able to make some statistics and evaluate numbers. When we want to work with excel, we need knowledge about the programme. Getting numbers as a representative result of ordering pictures is difficult. Especially when you do not have experience with statistics. Therefore, the effectiveness of this tool will depend on the knowledge and ability of the NMEs to apply the appropriate statistical package to analyse the results from the teachers. An even better programme to apply statistics is SPSS, but also in that case you need to know how to work with that programme.

The remaining tool is *3 lies/1 truth*. This tool offers multiple choice sentences about waste. Since just one answer had to be chosen by the pupils, *3 lies/1 truth* is easy to access. A subjective assessment by the teacher is therefore not possible. This objectivity makes validity easy to check afterwards. *3 lies/1 truth* also does not require much time. So this tool is more feasible for teachers (Clarke, Heaney & Gatfield 2005).

The amount of indicators that can be applied in a tool needs to be considered as well. We see the possibility to test all four indicators with *3 lies/1 truth*, if *the pupil indicates littering negatively*, if *the pupil is able to identify the ecological problem of waste*, if *the pupil is able to identify irresponsible waste behaviour* and *the pupil perceives high amount of waste as problem*. Consequently, also regarding the indicators *3 lies/1 truth* is an appropriate tool.

4.2.3 Attitude

To measure attitude we offered the tools *Fishing net and pond* and the *Statement game*. The *fishing net and pond* has got the weakness that even with a good explanation the answers might be different. Different kind of answers keeps space for interpretation and offers space for the Rosenthal effect (Rosenthal 1994). The space for interpretation would decrease the reliability and validity, and increase the time to assess the results of the *Fishing net and pond*. In comparison, the *statement game* is multiple choice and offers the possibility of using pictures. With pictures the *statement game* will not be a typical survey. The multiple choice setup does not offer space for an observer effect, which increase the possibility of reliability and validity. Besides, many studies have found that the methods similar to the multiple-choice questions are the most popular tool in exams, assessments and monitoring (Kuechler & Simkin 2003; Clarke, Heaney & Gatfield 2005; Roberts 2006). Furthermore, from three indicators, two can be tested with this tool: *the pupils wants to make a change regarding the waste problem* and *the pupil experiences negative feeling in the presence of litter.* The indicator *the pupil wants to learn more about the waste problem* is out of the focus of the *Statement game*.

4.2.4 Empowerment

Regarding empowerment we came up with a *simple questionnaire* and the *flower power*. The *simple questionnaire* is already dismissed, because the aim of the complete monitoring method could be too easily recognized, which would affect the answers (Silman & Macfarlane 2002). Additionally, research indicates that evaluating students with simple questionnaires is not adequate (Siegel & Ranney 2003), because of instrument reactivity. Instrument reactivity happens when pupils have to make the same test with time in between and the pupil is able to recall the responses and learn from the questionnaire itself.

The *flower power* is also a kind of a questionnaire, but in a more creative way. Still the aim is hard to hide within the *flower power*, because the students need to come up with own ideas to test the indicators. Additionally, if they come up with own ideas, the chance is higher that they also remember their ideas in their free-time. Coming up with own ideas is an active activity, while getting an idea by reading is related to passive learning methods. Active learning methods are shown to be more effective for promoting cognitive skills (Knight & Wood 2005; Michel, Cater & Varela 2009). The teacher needs to be more constructive when giving the instructions on the exercise, to avoid answers outside the scope of the topic. Therefore, the questions should not be about opinions but more about knowledge, what is feasible to practice and how to make a change. In this case, wrong answers are hard to give intentionally, because pupils can just give ideas that are in their mind. The only possibility to give more or less a wrong answer is by hiding and not telling ideas.

The validity of the tool *flower power* can be ensured if the exercise is clearly described. The description needs to make sure that the answers are not out of focus. For the assessment of *flower power*, we need to set clear rules to decrease the possibility of a Rosenthal effect and an observer effect. The first indicator, *the pupil can come up with own ideas to solve a part of the waste problem* is clearly considered by this tool. For the other two indicators, *the pupil has own experiences with actions that solve the waste problem* and *the pupil feels that his/her actions can make a difference*, the *flower power* needs to be extended.

4.2.5 Social norms

For social norms we considered the tools *spider web, tree of social norms, asking directly the students for a statement* and *giving a one word concept*. Visual methods have many strengths. Diem-Wille (2001) noted that using pictures, drawings, and metaphors will show a person's emotional state of mind much better than verbal descriptions or definitions. Thus, Diem-Wille (2001) indicates that using drawings or pictures is a powerful way to access information about the pupils

experiences based on the knowledge from the WRLs. However, drawings provides dominant thoughts and feelings about assessment. Demonstrating that the technique of using pictures is useful for examining students conceptions of assessment (Harris, Harnett & Brown 2009). In view of these findings, we deem *spider web* fit over the remaining tools.

Although children already early start to behave regarding social norms and enforce them as well (Schmidt & Tomasello 2012), we do not expect primary school children to know more about the terms of social norms or values. This possible lack of knowledge complicates the implementation of *the tree of social norms* and *the one word concept*. Additionally, every tool except for the *spider web* has got the weakness of interpretation and therefore the problem with validity and reliability. In contrast, the *spider web* is more or less a scale of different norms and values. The implementation takes short time and the results are much easier to assess as well. A problem with the *spider web* might be that by the given values and norms the aim of these exercises is presented, which can affect the quality of the answer (Silman & Macfarlane 2002). Therefore, much attention should be given to provide a precise description of the design to hide the aim as much as possible. To see the difference in social norms, two spider webs are presented in which the pupil can fill in the web for themselves and for their family. We don't let the pupil fill in the web for their peers, because we think the value of the pupils in this age class will conform to the values of their peers (SLO 2016).

However, regarding the indicators, the first two, *the pupil encourages the desired behaviour of others* and *the pupil discourages undesirable behaviour of others*, cannot be measured by a survey. In fact, measuring these indicators is not feasible to do for each student by one teacher, regarding time and observation skills. The third indicator *the pupil makes the desired choices despite contrasting external influences*, can be measured by a comparison of the results between the two spiderwebs. The fourth and last indicator, *the pupil expects others to care about the waste problem*, can be measured by the *spider web*. Regarding the weaknesses in feasibility of the other tools, the *spider web* seems to be the best tool for us.

4.2.6 Behaviour

Measuring behaviour change appears to be difficult. We came up with ideas like for example *collecting litter around school*. The amount of time available is important to take into account. As well as the fact that the pupils who have received litter lessons are not solely responsible for the littering on the school environment. A critical study of the project shows that only a few classes in a school participate in environmental programmes per time (Spiropoulou et al. 2007; Kimaryo 2011). If an evaluation like *collecting litter around school* is applied to evaluate a behaviour change among this group of pupils, the litter is assumed to originate from just this group of pupils. Therefore, the reliability and validity is hardly reached here.

Additionally, we had the tool on *checking if the pupils recycle*. The main problem with this tool is that schools in the Netherlands typically do not recycle. However, as the concept of "Afvalvrije school" is extensively implemented, an increase in attention to recycling is suggested for the future. Teaching pupils to recycle is hard when there is no opportunity to recycle. Teaching about recycling, but obviously not practicing recycling by themselves, is a contradiction that shows the inconsistency in the system. This contradiction can give children the impression that recycling is not as important as presented, since supportive tools and practices are missing (Boyd et al. 2005). Such a contradiction lowers probably the effectiveness of the WRL. However, teachers cannot observe the whole day if the pupils put the waste in the right bin. Consequently, the bins need to be checked later, when they are full. To enhance the knowledge about where to put the waste in, this check can be done together with the children. This check can also have an impact on social norms. Since checking the bins will probably gets boring for the pupils, so they want everybody to recycle right, because then the checking will cost less time.

Another tool we considered, is *collecting the snack waste*. Organizing paper boxes for each pupil to collect the waste will not be a problem. As well as keeping the boxes over the day under the table to have space to work. However, things can fall out of the box when the box is kicked accidentally. Then the class can get dirty. Additionally, the pupils might forget to collect their snack waste and throw the waste accidentally away. Partly not collected waste falsifies the results. Next to accidents in throwing the waste away, waste can be also thrown away by intention to get a 'better' result. The weaknesses of this tool are too striking to use the idea of *collecting snack waste*.

Instead, we also came up with a more feasible version. *Counting lunch boxes and reusable bottles* in comparison to food in plastic bags and PET bottles were also tools we conducted. The number of lunch boxes and reusable bottles is relative fast to check by teachers. As pure counting does not offer space for interpretation, the observer effect does not exist here and no interpersonal expectancy effect can take place. Thus, the results are more reliable here. Nevertheless, pupils in one

class, probably even in one school, affect the answers by talking to each other. To prove the impact of the WRL, several classes from different schools are needed. Each class would be than one "replicant". Additionally, in needs to be considered that pupils of one class or even the same school have typically a similar social background. The social background affects the results of the WRL (Carleton-Hug and Hug 2010). However, the waste reduction lesson needs to be effective for all social backgrounds. Consequently, an evaluation over different schools is necessary.

Indicators, that are applied for *counting lunch boxes and reusable bottles* are *the pupil chooses products with less packaging*, *the pupil does not produce litter* because *the pupil chooses products that can be reused*. The indicators *the pupil separates waste* and *the pupil picks up litter* are not covered here. For the first mentioned indicator, as mentioned previously, separating waste is not possible at the moment, since many schools do not have the tools. To achieve a separation in schools bins should be provided to facilitate the litter separation. For the second indicator, the teacher has to do the observing part, that is due to time not possible. A problem in assessing the choice of the pupils to use things that produce less waste, is also influenced by the parents. However, as we are focusing on group 7 and 8, we expect pupils in this age category to be able to justify their own opinion (Eccles 1999). Pupils in this age-category also got a voice regarding their food at school.

4.2.7 Process

Within the process, we considered other tools than surveys, that are feasible for evaluation, because the quality of the project's process is driven by many things. As an example, the enthusiasm and motivation of the teacher can play a role (Bettencourt et al. 1983; Patrick, Hisley & Kempler 2000), likewise the way the WRL is exactly implemented. To evaluate such things by a questionnaire, we need to assume that all teachers are good in reflection and self-perception. Even, if we could assume good self-reflection skills for every teacher, the quality of self-reflection decreases, when the focus is not on the self (Duval & Wicklund 1973). In a WRL the focus is probably not mainly on the self. Therefore, we considered as an additional tool the *class visitation by an NME person* as useful. Not every class that is going to implement a WRL needs to be visited, but a representative amount should be visited to see the typical weaknesses in such a lesson. Regular visits can identify weak spots in the lessons for improvement. An amount could be for example 40% of the schools that implement the lessons like in the project for Green schools in Suriname (Somwaru 2016).

For the tools that can be implemented by teachers we came up with the idea of building *focus groups*. The problem of *focus groups* is the subjectivity. Probably, the teacher makes a selection in a way that the outcome is affected so that a Rosenthal effect takes place (Rosenthal 1994). In combination with the observer effect, because a *focus group* is a kind of interview (Silman & Macfarlane 2002), the teacher can always come to the outcome that the process is good.

The *tips and tops by pupils* can be also very subjective. When the pupils are not interested about the topic of the lesson or the lesson is boring, the tips could go in the wrong direction. Thus, the quality of the resulting *tips and tops* depend a lot on the class itself.

The *tips and tops by the teacher* is about his perception on the lesson. The *tips and tops* should provide the NME with ideas about what different teachers like about the lesson and what they do not like and also to check if something is not working as planned. This tool is done relatively fast and therefore feasible in time. With the right question the *tips and tops by teacher* can also be used to provide a self-reflection for the teacher. However, the direct use of this tool for improving the running process is doubtful but we can stress the use of the *tips and tops* within the process by giving the advice to do so. This kind of feedback to the NME can also give a first hand idea on what are attention points when the outcomes are not what is expected and where improvements can be done. Thus, we see the *tips and tops by teacher* as really important. Here, the indicator *teachers are enthusiastic about the programme* and *the lesson is interactive* can be used. However, as the *tips and tops* are based on self-perception the results of this tool should be compared with the perception of an NME person. In contrast, *the checklist for teachers* to evaluate the process already exist according to the NME board. Therefore, we do not need to elaborate on this tool.

The *learning wheel* needs to come up with concrete questions for the pupils, but with the main focus on the process. This tool can be used as collection of what the students learned and especially what they did not understand. By providing a clear question and exercise, we can probably also lower the risk of interpretation and the Rosenthal effect. We have for example, no effect on the thoughts of the teacher about individual pupils. If a slow learning pupil mentions a point he did not understand the teacher will probably give less value to that statement based on his perception of the pupil. We can just provide an addition in the approach to lower the interpersonal expectancy effect. The additional would be the question on the whole class who agrees. This number needs to be added to the statement in the *learning wheel*. This

approach would provide the teacher better and more objective insights in the process quality. By this tool we are able to apply the indicators *the lesson material is sufficient for reaching its learning objectives*, *the lesson is executed according to plan*, *the pupil reaches the learning objectives of each lesson part* and *the time in the lesson is efficiently used*. To be more effective with the use of the *learning wheel*, attention should be given to ensure that the *learning wheel* is linked up with expectations of each lesson.

4.2.8 Enjoyment

For this determinant, we came up with different indicators and one tool. The second indicator *the pupil is happy that he can help in the waste problem* assumes that they have the attitude to change something. This correlation complicates measuring this indicator. The indicator *during the lesson the pupils participate actively* is best measured by observation and therefore very vulnerable for an observation effect (Silman & Macfarlane 2002) and the Rosenthal effect (Rosenthal 1994). The indicator *the pupil has a positive association to the programme* is used within the tool. If *the pupils are asked for their opinion* directly after the lesson the exchange about the lesson between the pupils is probably rather small while the validity and reliable is therefore rather high. The longer the teacher waits for asking, the more talks will be done about that topic, so then opinions can change (de Vaus & de Vaus 2001). To avoid this effect, the evaluation should be done directly at the end of each lesson. A further pitfall, regarding the effects of social norms is that pupils will observe each other before giving an opinion. Consequently, the teacher needs to ensure that the pupils cannot observe the responses from their peers.

4.2.9 Assessment of the creative survey

The projects are done on a class level. Thus, all pupils in one class get the same treatment. Therefore, the changes in pupils can be generalized on the class level, resulting in more reliable scores per project.

The assessment of the exercises can be categorized into three types. First, the outcome data of the learning wheel and tips and tops exercises are only considered by the teachers, not returned to the client. Second, the plenary exercises (counting lunch boxes, checking enjoyment and waste separation exercise) will be assessed as a class result on itself. The client will get the raw data of, for example, how many lunch boxes are counted before and after the project. This will provide enough data to the client to assess the effectiveness of the project. Third, the exercises the pupils do individually, will be assessed with the goal of constructing a score on the scale of 1 to 10, without decimals. This is a logical choice because 1 to 10 is a much used scale in the Netherlands, so both the teachers and the client are used to that kind of scale. The construction of the score happens through filling the answers into an available spreadsheet by the teacher. For the exercises '3 lies/1 truth', 'spider web' and 'statements game' the score will be proportionally by the kind of answers that pupils give. The remaining two, 'mind map' and 'flower power', require more interpretation. The interpretation space is decreased by providing the teacher with example answers and according scores by which the teacher can compare the pupils answers and give a score.

4.3 Limitations

In this chapter the limitations of our project will be presented. Although this project has met the aim, there were some limitations. Time was our major limitation during the establishment of the product. We came up with various ideas regarding the project and discussed the feasibility with each other, but the restricted time afforded us to create the tools as simple as possible. Consequently, a test of the creative survey beforehand was not possible. To conduct a test, the survey should be given to a target group once and three to four weeks later again to check for reliability (Sjöström, Holst & Lind 1999). This test could be done for a group of children for which the WRL is not planned. In that way you can see, if the pupils give the same answers the first and second time. When same answers are given, the test is reliable.

When other people had done the interviews the answers and the conversations would have been different. In the execution of the literature study, no clear boundaries were set. Besides, when other people had done the literature study, results could have been interpreted in a different way.

Besides, the possibility to have a face-to-face interview with a teacher (who already did a WRL) was not possible. Teachers were mostly very dense with the regular activities in their school. After several weeks of emailing with the NME, we only knew two teachers who did such a lesson.

On the other hand, we used two brainstorm sessions, in which only the 5 team members participated in. Thus, we can conclude that the results of this brainstorm sessions could have been different as other people were participating. The reason why we used two brainstorm sessions, was that there was no research available regarding indicators for WRLs. Consequently. More scientific research about indicators and tools for evaluation is needed. Besides, only two of our three WRLs had clear learning objectives. In the future clearly stated learning objectives for every WRL would be better.

In relation with the implementation of the creative survey, we already decided that the assessment had to be done by teachers, which includes converting the answers into quantitative data. However, teachers can unintentionally manipulate the scores, because they also have their own perceptions about their pupils. Teachers are human and humans make mistakes.

Last but not least, the same survey will be handed out to the same pupils one month before and month after the WRL. There is the possibility, that the pupils will remember the answers they gave the first time. Furthermore, there is the possibility, that they give answers that they think will be the rights ones, since one month before they had the WRLs. We thought about these limitations. However, we still think the monitoring should be done in the timeframe of two months, since otherwise the data collection will cover a lot of time. Consequently, the evaluation would not be possible for classes that made the WRL late in the school year.

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Appendixes

Appendix 1 Interview guide Arjen Wals

Introduction

1. Introduction of Jacqueline, the rest and the ACT course
2. Introduction of Arjen Wals by himself
3. Introduction of our project
4. Why are we going to interview you(Arjen Wals), for you critical mindset and your knowledge in EE.

Questions

1. What is your first impression?
2. Do you have an idea about WRLs?
3. What behaviour change can be expected by WRLs?
4. What should be always in such a lessons?
5. Do you have an idea for indicators that can show if a WRL works?

Appendix 2 Interview guide Maartje Langeslag (Dutch)

Wij: Welkom, wij zijn Niels en Bianca, en wij zijn studenten van de Wageningen Universiteit. Op het moment doen wij onderzoek naar drie "afvalverminderings-lessen" op basisscholen met betrekking tot het meten van de effectiviteit van deze lessen. Volgens onze informatie bent u nu bezig met het herschrijven van de lessen. Wij willen daar graag wat vragen over stellen. Vindt u het goed dat dit gesprek wordt opgenomen? Daarnaast zouden wij graag uw naam gebruiken in ons verslag, vindt u dat goed? Wij kunnen u eventueel een transcript sturen van dit interview, zodat u het van te voren kan lezen en eventuele opmerkingen kan maken?

Introductievragen:

- Wat willen jullie als organisatie met deze lessen bereiken?
- Jullie ontwerpen de lessen; hoe hebben jullie zicht op de uitvoering daarvan?
- Waarom is er voor gekozen om deze lessen te veranderen?
- Wat gebeurt er aan interne evaluatie van programma's? Waarop baseert u de keuze voor een bepaald programma?

Subquestion 1: What determinants of behaviour should be addressed in waste reduction lessons?

- Waar moet volgens u de focus op liggen in deze lessen?
- Empowerment? Kennis? Normen en waarden? Bewustzijn? Houding? Plezier?
- De lessen worden op het moment één keer gegeven, denkt u dat een les kan leiden tot gedragsverandering, een andere perceptie en/of meer kennis?

Subquestion 2: What are indicators for measuring these determinants?

- Om effectiviteit te meten: Wat moet je volgens u meten om te zien of er een verandering van bijvoorbeeld gedrag of kennis is na zo'n les? Waar zie/merk je dat aan?

Subquestion 3: What methods can be used by teachers to monitor these indicators?

- Worden NME projecten in het algemeen nu al geëvalueerd? Om het effect te meten bij leerlingen?
- Zijn er volgens u al methoden om gedragsveranderingen te meten bij kinderen? Welke methoden zijn dat gerelateerd aan milieu educatie?
- Hoe denkt u persoonlijk dat je het beste gedragsverandering kan meten?
- Is het naar uw mening voor een leraar mogelijk qua tijd om bijvoorbeeld gedragsverandering te meten?
- Zo ja, welke methode zou volgens u haalbaar zijn qua tijd? Heeft u ideeën?

In ons onderzoek willen we een methode gaan ontwikkelen, die leraren kunnen gaan gebruiken om bijvoorbeeld gedragsverandering en/of kennisverandering bij kinderen vast te gaan stellen na zo'n afvalverminderings les.

- Heeft u suggesties?
- Kan deze methode eventueel geïntegreerd worden in de herschreven lessen? Zodat je er achter kan komen of de lessen wel effectief zijn?

Appendix 3 Questionnaire for one teacher (Dutch)

Wij: Welkom, wij zijn Niels en Bianca, en wij zijn studenten van de Wageningen Universiteit. Op het moment doen wij onderzoek naar drie "afvalverminderings - lessen" op basisscholen met betrekking tot het meten van de effectiviteit van deze lessen. Volgens onze informatie heeft u als docent een keer het project Zwervend Afval gedaan, bij groep 7 of 8. Wij willen daar graag wat vragen over stellen. Uw naam zal niet worden gebruikt in ons verslag, zodat uw privacy kan worden gewaarborgd.

- Wanneer heeft u het project Zwervend Afval uitgevoerd?
- Wat was uw algemene indruk van het project?
- Wat denkt u dat de organisatie met dit soort projecten wil bereiken?
- Waar moet volgens u de focus op liggen in deze lessen?
  - Empowerment? Kennis? Normen en waarden? Bewustzijn? Houding? Plezier?
- Het project heeft een eenmalig karakter, denkt u dat het haalbaar is dat een les kan leiden tot gedragsverandering?
- Om effectiviteit te meten: Wat moet je volgens u meten om te zien of er een verandering van bijvoorbeeld gedrag of kennis is na zo'n les? Waar zie/merk je dat aan?
- Wat zijn suggesties van uw kant, om de lessen effectiever te maken? Om bijvoorbeeld gedragsverandering en/of meer kennis te realiseren?

In ons onderzoek gaan we een methode ontwikkelen die leraren kunnen gaan gebruiken om bijvoorbeeld gedragsverandering en/of kennistoename bij kinderen vast te stellen na zo'n afvalsverminderings les.

- Worden projecten in het algemeen nu al geëvalueerd op effectiviteit?
- Zijn er volgens u al methoden om gedragsveranderingen te meten bij kinderen?
- Hoe denkt u dat je het beste kan meten of er gedragsverandering is?
- In welke mate en op welke manier is het voor u als leraar mogelijk (qua tijd) om gedragsverandering te meten?

Appendix 4 Transcript interview Arjen Wals

Arjen Wals

Skype interview

23-09-2016 12:30 - 13:30 uur

By Jacqueline Langer (J)

J: First before we start, I would like to ask if it's fine if we record this interview?

Arjen: Sure!

J: And if it's also fine with you if we would use your name when we are relating to this interview in our text?

Arjen: Yeah, no problem

J: OK, fine. First, I don't know if you remember me, I did a course in environmental education with you, in the sixth period. That's how we got to you.

Arjen: Ja

J: In the moment we're doing ACT.

Arjen: Who am I looking at right now? You can see me, but I cannot see a moving picture on the other side, that's correct right? I think your video is off.

J: Ah, ok. Is it now on?

Arjen: Yes, now I see you; you look very different from before.

J: Ok [laughing], maybe just because my hair is open.

Arjen: Nonono, but I had a picture of Skype here.

J: Ok, yeah that's really a big difference.

Arjen: But sure, I remember you.

J: In the moment we're doing ACT involved in the design of a monitoring system of waste reduction lessons. We are five persons, but we didn't want to stand all here. They are all here except one. Bianca is studying Consumer Studies, Niels Human-Nature Relations, Ernest Management Economics, Fuad Aquatic Ecology and Water Management and I study Nature Conservation but a lot of Environmental Sciences.

Arjen: Right.

J: Would you like to introduce yourself?

Arjen: Yeah, I studied environmental science at Wageningen University, in the 80's. And got interested in environmental education, so I've been doing education and research in the field of environmental education, but this has become over time more sustainability education, or education vs[?] sustainable development. My interest is in designing learning processes, and educational arrangements that can help connect people with this planet or become more responsible in the way we live on the earth. So that's in a nutshell who I am. I work already for 25 years at Wageningen University, but I also work here in Sweden, where I'm now in Gothenburg, and I do a little bit of work for UNESCO.

J: Ok, so that's the reason why we chose you, you're the perfect person for that.

Arjen: Monitoring evaluation is always tricky though, but we'll talk about that.

J: Yes, that's true, but probably you know more about that than we do.

Arjen: Maybe.

J: Mostly we are talking to you because we think you are more critical than we can be. Because we don't know anything in the moment about that. And you're really into environmental education, as I said, we're more studying things that might be related to that but less really to education, more to environment at all, management studies, etc.

Do you know what waste reduction lessons are?

Arjen: I did receive your…, I think Niels sent me the proposal, the commissioners' request. But it would be good for me if you tell me about what the purpose is and what you hope to change in those that are going to be affected by it.

J: Yeah, it was in Dutch, maybe Niels can explain it?

Arjen: So what is it that you hope to change in those who are going to be exposed to it?

J: I just know they're 2,5 hours long, for primary school students, in three settings: group 1-3, 4-6 and 7-8.

Arjen: Ok, in the meantime I'm opening the case description so that I can look again. Yeah. So, creating a monitoring system to measure the effectiveness of waste reduction lessons.

J: We should also look at the focus: what would be the better focus: separating waste, or is it rather to produce less litter, or less waste at all? What would be the best focus to reach behaviour change in that area?

Arjen: Ja. So, and you did decide on kind of the age group is upper prime, or just all primary education?

J: That is what the aim was of our commissioner. We would like to focus more on group 7 and 8.

Arjen: Ok, yeah, I think it's good that they agree on that focus. That's a good decision because as children's' developmental stages and their progression in their thinking changes so much during those years you would have to have quite different monitoring evaluation programmes for each age group. So the focus on one group makes a lot of sense.

J: Yes, that was our aim to do that.

Arjen: So, let's say, that are 10-11-12 year olds?

J: Yes, exactly.

Arjen: Ok.

J: What's is your first impression, before we start with our questions?

Arjen: Well, indeed it is critical to think about your objectives of what you want achieve with children in that age group. I mean, if you look at the classic 3 R's: Reuse. The most sustainable solution would be to Reduce, you reduce the use of packaging and the things that we tend to throw away. And the second one would be to Reuse, so that packagings are used again. And the third one is Recycle, where you actually destroy it, but when you destroy it, you create something new out of it so that […?] energy. And the last one is that you Dispose of it.

So the question is: do you want to focus on should they learn about that order of things,you know, that could already be a lesson, you know Reduce, Reuse, Recycle, in that order. And then, if you still have waste, what do you do with it? That is already some kind of lesson almost. And then, the other thing is: of course you need to start with their live world: how do they connect to this issue, what is their prior experience, what is their prior knowledge and their prior understanding. They're all understanding their own behaviour, understanding how they influence by their behaviour others, that's a bit a social norm you could say, that's important at that age group. So, you need to define your objectives for this age group: what do you want them to get out of the lessons that are being developed. And of course the lessons that are being developed themselves need to specify these goals.

J: Ja, I think in the moment the most important learning objective for them is a behavioural change. Of course a behaviour change does not work directly by working on the behaviour. I think that's also what you said now, you also spoke about social norms and things like that, and also about the knowledge about Reduce, Reusing and Recycling. But they really want to have a behaviour change after that hours.

[10:00]

Arjen: Right, so these materials are already available right, they have developed these lessons? I've seen a few that Anne Remmerswaal sent me, some examples from I think, the city of The Hague and others; these are quite good I think in developing materials. These materials look quite slick and they probable have clearly defined objectives, Ok?

J: yeah, it's in Dutch so for me it's hard to read it.

Arjen: What I think is really important in monitoring evaluation is of course to get a kind of a baseline understanding of where they are. So usually this can be done by some kind of activity where they can express themselves in terms of what they know already about waste, what they know already about their own behaviour and whether this is done creatively through mind maps, you know where people associate with waste, or whether you let them take pictures of their neighborhoods when they are asked to take pictures of waste in their neighborhood and make like a gallery walk of that and then you have your lesson/programmes. You go through that, and then after, I don't know how many weeks or how many hours. You need to think at what time you do this, do you do it directly after or do you wait a while to see how long the impact of these lessons will last? That's another question: are you evaluating short-term or a little longer term? And then you can do the same kind of mind map, a few weeks later, to see if they're richer, if their understanding of waste and what can be done with it has improved. Classic distinctions are usually cognitive change: do they have more knowledge? Do they know more concepts? Do they know how these concepts link better? So that's the cognitive side. Then you have the second area that's also important is the affective/emotional side? Are they concerned about these issues? Does it bother them, does it upset them, what kind of feelings do they have when they see waste? Are they oblivious to it, or does it bother them at all? To have some kind of inventory into beginning to check after the lessons have been done, short-term after or longer term after, and you could do both, to see whether it extinguishes over time or whether it stays with them. But then to check with them if their emotions, their concerns have changed and developed. So that is the second area, the affective domain. And the third area is called the psycho-motoric domain: the hands, so to speak: to what extent do they… well it has overlaps with the other domains, of course. But, to what extent do they feel they themselves can make a difference, whether they do feel empowered. That's a question, in the beginning they may think "I can't do anything about this, everybody else is throwing it away and if I do it it won't make any change." Or do they have the sense, no, I'm a person, I can make a difference, I can get others to help and I can influence. They may not be empowered like that in the beginning, but maybe if the lessons are designed in a way that they become more empowered they actually invite them to do things and if they monitor themselves that things are getting better then they can have the feeling that they can make a difference. So, empowerment is something that you can look for and connected to the psycho-motoric domain is also just knowing how to behave differently. How do you separate waste? It is very confusing, for not just the children but also for adults. Where do you put what?

[15:00]

Plastic goes into plastic, but how about chips bags? They're not supposed to go into plastic because they have an aluminum coating. That's very technical, not easy; if plastic have food remains on it, should you still throw it in the plastic or not? Is chewing gum organic, or what is it? So where do you put that? So there's a lot of confusing in knowing how to separate and where to put it. Are they more clear on that after these lessons or are they more confused after these lesson? So, do they know how to act at the end? And also, you know, which makes it very complex is that do they know that we don't know for sure, because that's another problem, we all don't know for sure ourselves, we often know how given what we know today this is how we think we should do it. But it may be that we learn new things, or we find out better ways of separating things that in the future we may need to change again, and adapt to our new understanding, and that's a very difficult lesson to teach, but also a very important one.

J: Of course. What behaviour change would you expect after a lesson of 2,5 hours?

Arjen: Well I think there's usually 2 things that you can realize in this short period of time: an increased of knowledge and understanding and an increase in awareness. Those are the two things that you could probably design some pre- and posttest on, which doesn't have to be a survey, it can be, but it can also be a more artistic way of letting them express what they learnt. With very young children you would use drawings, but there are more things, like it seems that mind maps would work very well: a mind map before where you just associate anything that comes to mind when they talk about waste, or 'afval' or 'zwerfvuil' in Dutch, and see what they come up with; then you do two or more lessons and then you ask them to again get a sheet of paper and do that same activity again and then you can quickly see that the picture has become much richer, with more concepts, more connections and things like that, and that is kind of evidence that they have increased their understanding about waste and that they… Of course you can also ask them to (this is more the lessons themselves) monitor their own waste reduction at home, and things like that, and to see if after (this is longer term) they talk about this at home, you could ask that question: have you talked about this project at home? If they have then you could assume that there has been some kind of learning going on both in themselves but also in their home environment. So, I think you can test understanding and knowledge and

awareness more or less if it has increased. And the other areas, the emotional/affective side: there are some tools available where young people can express their feelings about something, sometimes they're choosing simple things like smiling faces vs. sad faces, you know these emo… emocons, how do you call them?

J: Emoticons

Arjen: Yes, you know, those that young people are more familiar with, more familiar with then we are, or that I am, and you can use that, and there might be even apps where they can express how they feel about something and evaluate their connection to the topic before the lessons and afterwards, and then you can actually see how the class as a whole has changed, which is also interesting for them to see.

[20:00]

So, in terms of their behaviour, i think the critical part of these lessons is to become aware of their own behaviour, if they don't know. I know a very good activity of the local environmental education centre in Wageningen, there are two very good activities for the Pantarijn school, little older age. On was called the candy-route. It is the route the kids walk from the Pantarijn over the Nobelweg to the Spar. It's just doable, it's a five-minute walk, you can go into the store for five minutes and then you can walk back so that's called the candy-route, because they buy candy and then on the way back they throw away the wrappers of the candy. And as a project the kids would walk the route, they would the gather all the waste, they would analyse it, they would find out where it came from, and they kind off trace as forensic detectives. Of course this leads to a lot of awareness; at the end they developed with the arts teacher new waste bins that they put, very nicely decorated, drawn by the students, the city pays for these waste bins, and they would put it on the candy route to the Spar. And this project I'm sure it offered a lot of, and they thought carefully about this project, it raised awareness, it also provide an opportunity to change behaviour, it let to a shift in the social norm, so that was a powerful project that you could evaluate quite well: do you find more or less candy wrappers after this project when you walk this route again. The other project was that they divided the class in groups then they got €5 each and they had to buy at the shop a list with the same things on it, and their task was to buy the same things with the least amount of packagings. I'm not exactly sure about how it went, but it came down to the fact that certain items have far more packaging than others even though they are the same thing. And they would then bring it, unpack it in the classroom and compare the piles and then look at the cost. These were really mind-changing activities. It depends a lot on the design of the teaching materials, whether you are going to see impact, but it can be done, I think.

J: 2,5 hours are not a lot of time, so is there something you would like never to miss in that time? So what should always be in in such a lesson of 2,5 hours?

Arjen: What should always be in there is an inventory / an introspection / a reflection of the child: what is his/her own relationship / feelings with waste? What prior understanding / knowledge / affection / emotions does a child have with the topic? Usually there will be differences in a classroom, and if they have a good way of sharing each other's connections with waste and with each other's emotions then they already start learning from the differences that you find in the classroom with regards to waste. So, critical, I think, is reflection on the student's own connection with the topic. The other one is that is should go beyond awareness. I think when it's only awareness, 'O, this is a problem, and it's everywhere around us, and we're all guilty', then that's where it stops. Then it can lead to apathy, hopelessness, feeling 'ok, it's a bad problem, and I know a lot about it, and I can't do anything about it, it's too big, and I'm just a little child', so you need always to connect to the possibility to act, to bring about change and to do something concrete, whether it's making those waste bins along the candy trail, or whether it is starting a recycling centre at school, or having an awareness by having the students making an awareness campaign or posters that can help increase awareness within the school itself, that is already an action that they can do themselves, that give them at least not just the feeling but the real experience of trying to influence or change the world, and that is a critical lesson for young people to get. When you never get that lesson in your life than how can you expect people to try to bring about change?

[26:00]

J: So you think the most important thing is to empower children?

Arjen: Ja, certainly when you only focus on awareness raising then, if you only focus on knowledge, understanding and awareness, then you may be better of not doing it, in fact. Because the effect is worse, because it leads to apathy and powerlessness.

J: So, no matter what we are doing, the 2,5 hours needs to be filled with empowered students so that they don't feel bad about that topic.

Arjen: Right, they must feel like they can make a difference. And of course it's also good to think about another outcome that I think is important, that's to think about not just the consequences for humans, but waste travels, and it affects other species. So it would be good to have some moral reflection, some ethical reflection, about who are we as homo sapiens to basically kill other species by the way we behave. You make a link to oceans and plastic nanoparticles entering food chains and the bodies of other animals and ourselves, to get some connection that things are interrelated and connected and that you're part of an organic system. That's not an easy thing to learn, but I think, when you talk about waste, you could really try to show that thrown away waste is never gone. It stays basically no matter what you do with it, it stays. So how can we make it stay in a good way, so that it doesn't destroy life, that's a critical lesson. If you burn waste, it's still there, it goes into the air. So, this systems thinking, but also the ethical part, thinking about are we responsible for other species, and do we have to be more sensitive to that are important questions, but again, connect it with the possibility to make concrete change in your own life and your own environment.

J: You gave a lot of insights already, also on how can we measure things. Are there still some indicators in your mind that we can use to how to make such a lesson work?

Arjen: There's nothing that jumps to mind right now, but you probably do a little bit of research on your own. There might be some specific research on waste reduction and recycling programmes, may be not with children, may be there too. I mean there are these journals like Environmental Education Research, The Journal of Env. Education that over time, especially in the 70's and 80's there have been studies. More recently there's less an evaluation of specific behaviour change, but you'll find something.

[30:00]

I sent some documents that are basic, but that can help. I think I'll probably learn from your work as well, I hope.

J: Yeah, well we do all our effort into it.

Arjen: Ok, that's good!

J: That's necessary.

Arjen: You're being evaluated too hey?;)

J: Are there still some questions left from our group?

Arjen: I need to be going in a moment.

J: Still something you want to say?

Arjen: Is Niels the only one that speaks Dutch in the group?

J: No, also Bianca.

Arjen: Because the materials are quite interesting, they offer a lot of guidance in a way, but I know they're in Dutch. I'm sympathetic because I'm now in Sweden and I get a lot of interesting things in Swedish which I cannot read, but then I try to survive: my Google Chrome translates every website into English automatically, may be that's the same in Holland for Dutch. I do a lot of pasting of Swedish into Google Translate, it does help. It's pretty good. It's not exact. So I do recommend to also get access to the Dutch text so that you understand better what the material is about, because that's a difficulty in ACT projects that focus on Dutch cases. The language sensitivity is important, and then you come to rely on the one or two dutch students who become in a way interpreters, which is a good role but it's not why they're studying at Wageningen University, so it's sometimes a disadvantage for them that they have to also play that role. But may be they don't mind, but I encourage people to also get the sense of the material, the flavour of it, and how it's designed. Because it looked like it was pretty good materials. The question of course is always: do schools have the time to do it? Even though they're only 2,5 hours, they often feel like they're overcrowded, the curriculum, and that they don't have the time for it, so it would be great if your work would lead to some guide to how to evaluate this work, because having some kind of evidence that it does work will help in municipalities promoting this type of education and it will, I think, strengthen environmental education in schools, if you can show in fact.

J: But that also says that it's not the best way to evaluate by teachers, but also to look at other people that can evaluate it.

Arjen: That's right, and I think teachers are more interested in the well-being and the learning and the capacities of the students than in reducing waste, that's not their primary concern. Their primary concern is development of the whole child, and you can say that that part of citizenship is very critical, but they will also look at how does it develop the capacity to think and to feel and to be empowered and the context of waste is for them a context, it's not necessarily their desired outcome. So in that sense there are differences between what the ministry of Environment would like to see happen and the ministry of Education would like to see.

J: So in the moment we focus more on teachers that are going to evaluate but this means that we should also open our focus on who can really do it, who has got the time, who is interested in seeing the goals being reached.

Arjen: All right, hopefully this helped a little bit and I wish you success with the project.

J: Thank you a lot, you helped a lot.

Arjen: OK, have a good day and hopefully the weather is still good in Holland.

J: It is!

Arjen: Is it? I wish it were as good here. Anyway enjoy the weekend to then!

J: Yes, we will. Bye!

Arjen: Bye!

Appendix 5 Transcript interview Maartje Langeslag (Dutch)

Veldwerk Nederland

Het Woldhuis 11, Apeldoorn

12-10-2016 13:25 - 14:05 uur

door Bianca Oomkens (B) en Niels de Vos (N)

B: U gaat het programma herschrijven dus daar willen we ook wat vragen over stellen. Maar als eerste, als introductievraag vroegen we ons af wat u als organisatie met deze lessen willen bereiken.

Maartje: De lespakketten zijn vanaf groep 1 t/m groep 8, dus het is echt vanaf het kennismaken met de problematiek, van 'hé zwerfafval, wat is dat eigenlijk, en hoe komt dat?' maar ook willen we hen na laten denken over 'wat vind ik er nou eigenlijk zelf van, en wat zou ik er zelf mee kunnen en willen doen?' Dus we willen er eigenlijk mee bereiken dat ze over het thema nadenken en ook het aan zichzelf koppelen, dus niet alleen theoretisch maar ook dat ze bij zichzelf stil gaan staan: 'dit vind ik eigenlijk niet oké, en wat kan ik er dan eigenlijk aan doen?' en dan daar ook eigenlijk handelingsperspectief in bieden: wat kán je dan ook echt gaan doen?

B: Dus eigenlijk wat voor gedrag er ontstaat?

Maartje: Dus eigenlijk proberen we wel een beetje op de drie poten van

kennis wat is het nou eigenlijk, de basisdingen: de afbraaktijd, dat ze daarover leren,

houding: wat vind ik daar nou van, hoe ga ik daarin staan

en dus ook gedrag: we gaan ook dingen uitvoeren, waaronder bijv. met knijpers aan de slag gaan.

B: Jullie ontwerpen de lessen, maar hoe hebben jullie zicht op de uitvoering ervan, want vaak wordt het gewoon door een docent gegeven?

Maartje: Wat we zullen gaan doen wanneer we het nieuwe pakket klaar hebben is dat we eerst een aantal gastlessen zelf gaan verzorgen, dus dan krijgt de docent ook mee hoe je dat dan ook kan doen, en vervolgens, na die periode, waarin we ook nog kunnen aanpassen waar nodig, en vervolgens gaan docenten er zelf mee aan de slag. En hoe we dat precies gaan evalueren moeten we nog bedenken. Sowieso gaan alle docenten invullen hoeveel afval er is gevonden en eventueel moeten we daar nog iets van een evaluatie bij doen over hoe de docenten dat zelf hebben ervaren, maar ik weet niet of dat een goed antwoord is op je vraag?

N: Maar die gastlessen dat zien jullie eigenlijk als een pilot voor het materiaal.

Maartje: Ja, dat is inderdaad om het materiaal uit te proberen en ook dat de scholen er al bekend mee raken van hoe dat dan ongeveer gaat, vooral omdat er ook stukjes in zaten van bijv. filosoferen met kinderen: hoe gaat dat dan precies? Dat kunnen wij dan een keertje neerzetten en dan kan de docent het makkelijker zelf oppakken de volgende keer.

N: Is het organisatorisch het geval dat een beetje dezelfde scholen elk jaar deze lessen geven?

Maartje: We hebben een soort cyclus pakket gemaakt: we hebben drie verschillende thema's, die zijn we nu dan ook aan het uitwerken, we zijn nu één thema aan het herschrijven. Het idee is dan dat ze eigenlijk elk jaar er weer aandacht aan kunnen besteden maar met steeds net een andere invalshoek. Dus het ene jaar over 'wat is het eigenlijk?', en dan gaat het meer over 'wat vind ik er nou zelf van?' en dan 'wat zijn nou de verantwoordelijke partijen en wie zou wat kunnen doen', en op die manier kan er jaarlijks aandacht worden besteed met steeds een klein beetje andere wijze.

B: dus als ik het goed begrijp krijgt elke leraar elk jaar een soort van bijspijkercursus over het programma?

Maartje: Nee, dat is eigenlijk niet per se de insteek; de insteek is dat nu gaan we zelf een paar pilots doen, maar het is wel echt zo bedoeld dat de docent het zelf op kan pakken, dus ook dat als er volgend jaar nieuwe scholen bijkomen, dan gaan wij niet het ook daar nog een keertje helemaal voordoen. Dus we gaan het zo schrijven dat zij het helemaal zelfstandig kunnen oppakken. Dus, die pilots die we eerst doen zijn eigenlijk voor onszelf, over 'werkt dit goed?'. Het bestaat uit drie lessen, en wij doen dan één van die lessen en kunnen dan ook terugkoppelen met de docent over hoe het is gegaan en waar we nog dingen moeten aanscherpen? Maar daarna moet het gewoon een product zijn wat helemaal zelfstandig door de docent wordt opgepakt.

B: Dus je gaat eerst testen met een paar docenten en daarna wordt het gewoon één …

Maartje: Ja, precies.

B: Ok, waarom is ervoor gekozen om deze lessen te veranderen?

Maartje: Ze zijn toendertijd vrij vlot geschreven, en ze zijn toen aangeboden aan Groen Gelinkt, ik weet niet of jullie dat kennen? Die hebben dat toen gescreend en aan de hand daarvan zijn toen wat veranderingen doorgevoerd en toen nog een keertje gescreend, en nu ben ik daar aan de hand van weer veranderingen aan het doorvoeren. Dus eigenlijk om het te verbeteren maar ook om meer differentiatie aan te brengen, omdat het eerst ook best wel snel geschreven was en er ook niet zoveel verschil tussen de lagere en hogere groepen gemaakt was, terwijl dat eigenlijk wel heel belangrijk is, want het is een heel ander niveau en werkwijze, dus dat zijn we nu ook beter aan het toepassen. Dus eigenlijk het verbeteren en beter differentiëren.

B: Maar jullie wisten dus dat het niet helemaal goed was doordat Groen Gelinkt …

Maartje: Groen Gelinkt is een organisatie die dan eigenlijk doet wat jullie ook een beetje gaan maken, gedeeltelijk. Die bekijkt het dan op verschillende punten, en geeft er dan opmerkingen bij, en aan de hand daarvan konden we dus kijken van 'nou inderdaad, die punt kan beter, dat punt kan beter'; mede aan de hand hiervan en een beetje door eigen verstand zijn we het nu aan het verbeteren.

B: Wat gebeurt er aan interne evaluatie van de programma's? Waarop baseert u de keuze voor een bepaald programma, omdat er verschillende soorten programma's zijn (Zwervend Afval, De Klieners, en 130

meer). Waarom kiest een bepaalde organisatie voor dit programma?

Maartje: En met een organisatie bedoel je dan ons, of bedoel je scholen?

B: Beide, waarop wordt de keuze gebaseerd?

Maartje: We hebben deze dan natuurlijk zelf gemaakt, de vraag daarom kwam vanuit de gemeente die wilde dat we daarmee bezig gingen en ook materiaal ervoor zouden maken. Dus eigenlijk vanuit een vraag van de gemeente zijn we dat gaan ontwikkelen. Waarom scholen dit kiezen? Als we het aanbieden en zij vinden het aantrekkelijk, dan…

B: Er zijn dus 130 verschillende van dit soort programma's, dat vonden wij een beetje apart, waarom er zoveel zouden moeten zijn.

Maartje: Over Zwerfafval?

N: Dit is wel jullie enige programma over dit onderwerp?

Maartje: Over Zwerfafval is dit in principe wel de enige die we hebben ja. We hebben wel heel veel andere, want ik weet niet of die 150 gaat over wat wij als organisatie hebben?

N: Nee, in totaal. Er is een inventarisatie gedaan door Sjoerd Kaarsemaker: daar stonden 130 programma's over Zwerfafval.

Maartje: O ja, zo hé! Ik denk dat heel veel partij ook deels het eigen wiel aan het uitvinden zijn, en dat hou je toch. En als je de vraag 'wil je een pakket hiervoor maken, in een driejarige cyclus' krijgt uit de gemeente, dan doe je dat. Maar als een andere gemeente ondertussen met dezelfde vraag gaan aankomen dan wordt er veel dubbelop gedaan aan werk. En het zal deels ook wel verouderd zijn neem ik aan?

N: Dat weet ik niet. Het zijn wel vaak programma's die gekocht zijn van een ander NME-centrum en dan iets veranderd, en dan is het al een ander programma.

Maartje: Dan zijn dit eigenlijk ook al drie programma's. Misschien ook zelfs wel negen: want je hebt dan drie thema's en dan ook nog voor drie verschillende leeftijdsgroepen.

B: Waar moet volgens u de focus op liggen in deze lessen?

Maartje: Ik vind het belangrijk dat het niet moralistisch wordt, dus dat het niet is van 'je mag geen Zwerfafval op straat gooien, want dan gebeuren er verschrikkelijke dingen', maar vooral een stukje bij henzelf aanwakkeren van bewustzijn. Je geeft ze natuurlijk wel handvatten: met hen bespreken waarom afval niet goed is, maar uiteindelijk willen we dat ze zelf een idee erover vormen dus dat ze zelf echt een mening gaan vormen en formuleren en ook op basis daarvan gaan kiezen zij zelf zouden willen doen. Dat is wij mij betreft het belangrijkst: dat je niet het oplegt maar dat het vooral even bewustzijn is. De één zal dat veel erger vinden dan de ander, en die zal dan ook veel eerder actie ondernemen dan de ander, dat is ook niet per se verkeerd. Als er maar voor zichzelf een bewustzijnsproces is gekomen.

B: In ons onderzoek hebben we tot nu toe een paar determinanten vastgesteld, waar ook lessen op gefocused zouden moeten zijn. [we noemen de determinanten op en Maartje bekijkt ze] Bent u het daarmee eens?

Maartje: Empowerment houd dan in dat ze handvatten krijgen om zelf iets te doen?

N: Misschien is handelingsperspectief wel de juiste vertaling ervan?

Maartje: Ja, gisteren hadden we het er ook al over dat het misschien wel een combinatie is van: als je empowered ben ben je gemotiveerd om het te doen én je hebt ook het handelingsperspectief waardoor je het wílt doen en je het ook kúnt doen. Maar die kennis is dan ook weer verbonden daaraan, dus…

B: Ja, ze hebben ook allemaal een relatie met elkaar natuurlijk. De meeste lessen worden op het moment maar één keer gegeven; denkt u dat een les kan leiden tot gedragsverandering of een andere perceptie of meer kennis, omdat het best wel kort is.

Maartje: Nouja, in principe is gedragsverandering heel moeilijk met educatie, en het is ook moeilijk om dat echt goed te meten, zelfs houding is eigenlijk al best lastig om te meten. Nou bestaat in principe dit wel uit drie lessen, dus er wordt wel drie keer aandacht aan besteed, maar ik denk dat als je ook echt gedragsverandering wil zien dat je dat dan eigenlijk ook een stukje al binnen de school gestructureerd moet doen zegmaar, en dat kan dan door, als je het hebt over gewoon afval, door als school ook afval te scheiden, dan kan je ook echt al een stukje gedragsverandering zelf sturen zegmaar zodat ze dat al gaan doen. Je kan als school wel ook regels opstellen die je gaat doen, en jezelf daar ook aan houden, en op die manier een beetje een gecontroleerde gedragsverandering hebt. Maar ik ben altijd heel voorzichtig om te zeggen dat als je zo'n les doet dan gaan alle kinderen voortaan ineens nooit meer iets op straat gooien, want dat is gewoon denk ik niet helemaal realistisch.

B: Dus u denkt eigenlijk dat deze lessen alleen invloed hebben bij scholen die er al wat meer aan doen?

Maartje: Ik denk in ieder geval dat het niet te generaliseren is, sommige kinderen zullen het zich meteen ook heel erg aantrekken en denken van 'nou, dat doe ik niet meer', en er zelfs iets van zeggen tegen een ander, en een ander blijft het stoer vinden om het toch te doen. Dus ik vind het moeilijk om te generaliseren dat het op iedereen een positief effect heeft, maar ik denk dat het wel bijdraagt aan gedragsverandering en dat kan dan natuurlijk samenhangen met verschillende dingen die ze misschien nog thuis of op televisie meekrijgen, ik denk dat het wel een belangrijke aanvulling kan zijn op gedragsverandering.

B: Dus dat eigenlijk zo'n les een gedeelte van het oplossen is, maar dat het ook aan thuis ligt en aan de school an sich.

Maartje: Precies, het moet eigenlijk via meerdere kanalen gaan. En ook simpelweg dat er genoeg prullenbakken zijn, dat ze niet denken 'wat moet ik nou met m'n pakje, ik zie nergens een prullenbak'.

B: Vorige week hadden we het er toevallig met de Werkgroep ook over gehad dat blijkbaar hebben scholen niet de contracten om afval te scheiden, dat dus eigenlijk best wel lastig is.

Maartje: Ja, we doen hier nu een pilot mee, dat is dan een thema 'Gewoon afval'. Er wordt dan een pilot gedaan dat zij nu wél gescheiden mogen leveren en dat het dan ook als zodanig wordt opgehaald. Want eigenlijk is dat natuurlijk ook idioot dat het om die reden voor scholen een gedoe is om te scheiden om dat natuurlijk juist als gemeente te faciliteren. Dus nu wordt er dan ook pilot gedaan om dat met een paar scholen in ieder geval

tijdelijk zo te doen, en hopelijk wordt dat dan in de toekomst opgelost.

N: Bedoel je daar de pilot 'Afvalvrije school' mee?

Maartje: Ja, daar is het inderdaad een onderdeel van en daar is dus binnen dat project is het inderdaad afgesproken met een paar scholen en de gemeente. Dat had René misschien al verteld? Of Evelien?

N: Esther Veenendaal van Rijkswaterstaat kwam erover vertellen.

Maartje: Ok. Nouja, ik moet zeggen, ik ben zo nieuw in de organisatie, dus ik weet ook alles nog niet zo goed.

B: Wij willen dus kijken hoe je de effectiviteit van dit soort lessen kan meten. Wat moet je volgens u meten om te zien of een verandering van bijvoorbeeld gedrag of kennis is na zo'n les. Hoe kan dat gemeten worden vindt u?

Maartje: Ten eerste vind ik het altijd discutabel hoe je onderwijsdingen meet. Soms vind ik dat wordt gedaan alsof het echt wiskunde is, maar dat is het natuurlijk helemaal niet. Je hebt zoveel verschillende factoren die er zijn. Maar wat je kunt doen, en wat overigens ook een onderdeel is van dit programma, is dat je kinderen van tevoren een lijstje laat invullen met een stukje kennis en ook een stukje houding en gedrag, dat je dat door middel van vragen dan meet en dat je dat na een bepaalde periode weer doet. En misschien om het nog beter te doen zou je eigenlijk het ook een andere groep moeten laten doen, maar dan wel een hele grote groep om te zorgen dat het dan niet beïnvloed wordt. Maar op zo'n manier kun je wel iets meten, alleen is het dan natuurlijk wel eigen verslag van hun eigen gedrag, en dan kun je weer wenselijke antwoorden krijgen. Dus dat is een meting die je zou kunnen doen. Je zou het dan kunnen aanvullen misschien met wat de docenten zelf zien en ervaren rondom de school.

B: Want we hadden het ook wel gelezen dat er dan al van tevoren een lijstje was en daarna, maar wordt dat dan ook ergens opgeslagen, die antwoorden?

Maartje: Nee, zoals het er nu inzit is het echt puur voor het leerproces van de kinderen en van de docent, dus dat de kinderen zien van 'hé, dat heb ik geleerd de afgelopen tijd', of 'ik ben er anders over gaan denken' of 'ik heb eigenlijk niks geleerd en denk er nog steeds hetzelfde over' en voor de docenten is het eigenlijk een terugkoppeling naar het leerproces, een reflectie naar jezelf. Het is dus niet alsof zij dan die antwoorden aan ons moeten doorgeven en dat wij dat dan opslaan.

B: Ja, dat vroegen wij ons namelijk af.

Maartje: Ja, het is geen gekke vraag omdat het wel echt zo'n lijstje is; het ziet er ook bijna uit als zo'n onderzoekslijstje. Maar daarvoor is het in principe niet bedoeld. Als jullie dingen willen meten zou je natuurlijk de docenten kunnen vragen of ze het willen delen.

B: Weet u of dat NME projecten in het algemeen al worden geevalueerd? Vind daar al iets van evaluatie plaats?

Maartje: Een deel van de projecten wordt wel naar Groen Gelinkt gestuurd. Dat is natuurlijk alleen op basis van het programma, dus dat is ook beperkt, maar dat gebeurt wel [grondig].

B: Maar dan alleen door Groen Gelinkt, en niet door jullie zelf?

Maartje: We proberen zelf natuurlijk altijd als we lessen hebben of gastlessen geven met de docent na die tijd weer te bespreken over tips ter verbetering of wat er beter kan. We hebben het er laatst weer over gehad dat we dat toch weer eigenlijk moeten standaardiseren. Maar hoe doe je dat dan precies, want emails daar worden mensen ook wel weer een beetje gek van, maar waar ik vroeger zelf werkte deden we het gewoon van even na de les snel een formuliertje invullen, en dat vinden docenten vaak ook niet zo erg, terwijl je er zelf toch wel weer waardevolle informatie uit kunt halen. Dus het gebeurt nu ook maar niet heel gestructureerd, maar we zijn wel aan het kijken of we dat misschien op iets gestructureerde wijze kunnen toepassen.

B: Maar op het moment gebeurt zo'n gestructureerde evaluatie dus niet.

Maartje: Het is niet dat we een evaluatieformulier laten invullen. Het is nu meer dat we mondeling nabespreken.

B: Zijn er volgens u al methoden om gedragsverandering te meten bij kinderen?

Maartje: Er zijn natuurlijk wel allerlei bedrijfjes die proberen om wel te meten. Voorheen kom ik eigenlijk meer uit het educatievlak op heel ander gebied. Dat ging meer over diversiteit en uitsluiting, en daar had je dan die BES programma's die bewezen moesten worden op effectiviteit. Dus er zijn wel bedrijfjes die dan in ieder geval zeggen die effectiviteit te meten. Dus daar zullen ze ook wel bepaalde modellen voor hebben.

B: Je weet niet welke bijvoorbeeld?

Maartje: Nee, ik weet niet hoe ze dat precies doen nee.

B: Kent u ook methoden die gerelateerd zijn aan milieu-educatie?

Maartje: Naast Groen Gelinkt ken ik die niet, maar dat heeft denk ik ook veel te maken met het feit dat ik pas sinds september in deze wereld zit, dus als je dat nog zou willen weten dan zou ik dat nog even aan m'n collega kunnen navragen of zij daar verder van op de hoogte is. Want als ik nu nee zeg is dat niet heel representatief voor de NME wereld.

B: Dus dat kunt u dan nog even voor ons navragen?

Maartje: Ja, dat zou ik kunnen doen. Dus even voor de duidelijkheid: je wilt dus weten of zij weten van programma's die de effectiviteit van milieu-educatie meten.

B: Nu een echt persoonlijke vraag: wat denkt u hoe je het beste gedragsverandering kan meten?

Maartje: Dat heb ik eigenlijk net ook al een beetje gezegd. Een combinatie van eigen verslag van gedrag en wat andere partijen erover kunnen oordelen.

N: Dus bijvoorbeeld een combinatie van zo'n self-report en een checklist voor een docent?

Maartje: Ja.

N: Ik ben ook wel benieuwd naar wat die bedrijven doen dan, over effectiviteit.

B: Maar 'eigen reflectie', op wat voor manier dan?

Maartje: Door bijvoorbeeld zo'n enquête van tevoren in te vullen of door van tevoren interviewtjes te houden met leerlingen, of misschien een combinatie ervan, daar ben ik altijd wel voorstander van om het sowieso zowel kwantitatief te doen, dus met heel veel leerlingen maar ook random een aantal waar je dan even mee spreekt, en dat moet dan wel goed ingeleid worden zodat ze wel weten dat het geen toets is.

B: Ja, daar zaten wij eigenlijk ook wel mee.

Maartje: Bij m'n vorige werk hebben we ook weleens zo'n onderzoekje gedaan, dan ging de helft het van tevoren invullen en de andere helft na die tijd, maar dan moest het inderdaad ook helemaal zo ingeleid worden: het is heel persoonlijk, je hoeft niet bij elkaar te kijken en het gaat echt over jezelf, je krijgt er geen cijfer voor. Dat is toch een beetje wennen voor ze, dus dat maakt het meten gewoon ietsje lastiger. Maar goed, het kan wel, vooral als je dan in de reflectie van je onderzoek in je achterhoofd houdt dat er sprake kan zijn van wenselijke antwoorden.

B: Is het naar uw mening mogelijk voor een leraar qua tijd om bijvoorbeeld gedragsverandering te meten? Omdat een leraar natuurlijk al best druk is.

Maartje: Het hoeft niet per se heel veel tijd te kosten, maar als je bijvoorbeeld zo'n stukje hebt zoals hier dan in zit, dat laat je ze even doen en doe je uiteindelijk weer en dan heb je daar wel een indicatie van, dus ik denk dat het wel mogelijk is, alleen je wilt dat niet constant op alle gebieden gaan doen, want dan kun je daar wel je week mee vullen. Nee, ik denk dat dat wel mogelijk is. Ik denk dat de docent er ook al gauw wel een indruk van krijgt, ook op andere gebieden bijvoorbeeld pesten: je kan natuurlijk wel merken van hé, merk ik nou dat het anders gaat in de klas? Dus ik denk dat ze het vaak ook al een beetje impliciet doen, maar met beperkte metingen denk ik dat het wel haalbaar zal zijn, maar dan moet de docent wel gemotiveerd zijn om dat te doen.

B: Dat hebben we vaak gehoord, dat de motivatie van de leraar ook wel belangrijk is.

Maartje: Bij de effectiviteit van een programma is de docent ook heel belangrijk, dat hebben we net vanochtend ook weer gezien, dan zie ik verschillende docenten en hoe ze dan groepjes begeleiden, maar als je gewoon er een beetje bij staat, of je gaat zelf ook helemaal 'moet je kijken, wat ik nou heb gevonden!' maakt gewoon een wereld van verschil. Dat heb je natuurlijk niet in de hand.

B: Dan is het van onze kant al bijna klaar. Een kleine samenvatting wat wij gaan doen is dat wij een methode gaan ontwikkelen die leraren kunnen gebruiken om het verschil in kennis, gedrag en houding te kunnen gaan meten. Heeft u nog suggesties waar we volgens u nog wel rekening mee moeten houden, of heeft u alles al gezegd?

Maartje: Ik ben nog benieuwd: is dat dan ook een middel wat zij echt specifiek voor natuureducatie gaan gebruiken? Of zelfs helemaal specifiek Zwerfafval?

N: Ja, zelfs zo specifiek.

B: We gaan dus één questionnaire maken met verschillende tools voor verschillende determinanten zoals kennis/houding, en dan willen we dat vóór en na meten, en dan kijken of er een verschil in antwoorden is. En dan moet het natuurlijk niet teveel tijd kosten, want het moet natuurlijk ook wel gedaan worden en ingevuld worden en dat is eigenlijk waar wij nu mee bezig zijn.

Maartje: En het doel is dan dat uiteindelijk jullie via die docent gegevens krijgen over de verschillende programma's? Of is het doel meer dat je de docent wilt helpen met zo'n programma?

N: Nou, wij gaan niet echt over de implementatie ervan nog, wij maken alleen nog maar de tool. Maar ik geloof dat het hogere doel is dat NME centra, dus bijvoorbeeld jullie over jullie programma, dat kunnen implementeren in zo'n les, en dat jullie dan ook te weten komen hoe effectief het is.

Maartje: Dus het zou ons kunnen helpen om in te zien wat het effect is en wat we hebben gedaan.

B: Ja, want door dat te meten kun je er bijvoorbeeld achter komen dat blijkbaar bijvoorbeeld het stukje normen/waarden niet goed in de lessen zit, en dan kun je dat later weer aanpassen. Maar dan moet je er wel achter komen waar het aan ligt.

En dan als laatste vraag eigenlijk: denkt u dat onze methode eventueel geintegreerd zou kunnen worden in een herschreven les?

Maartje: ja, dat zou eventueel als vervanging kunnen zijn van wat we nu hebben. Die zijn we nu ook al een beetje aan het herschrijven, want bijvoorbeeld voor lagere groepen proberen we nu toch iets simpeler en aansprekendere manier te doen, maar als het ook op verschillende niveau's kan worden ingezet dan zou dat kunnen. Het is alleen aan de docent om dat ook daadwerkelijk te doen, maar het is een onderdeel van de les, dus ze zouden dan ook in plaats van dat enquetetje hier Yurls kunnen gebruiken. We hebben nu ook een Yurls pagina gemaakt voor deze methode. Je kunt bij Yurls eigenlijk een soort simpele website maken en daarop zetten wij dan ook alle handleidingen en filmpjes die binnen deze lessen worden gebruikt, dus dat is voor een docent handig omdat die dan meteen die dingen op het digibord kan laten zien, en je hebt alles bij elkaar. Maar daar zou bijvoorbeeld dan ook een link kunnen komen naar jullie questionnaire, en dat we het dan wel opnemen als onderdeel hiervan. Het zou dus goed kunnen, juist omdat het dan een onderdeel er al van is.

N: Dat zien wij ook als optimaal, als het onderdeel is van.

Maartje: Maar ik denk wel dat een belangrijke voorwaarde is dat het echt weinig vragen zijn en dat het goed op de leeftijd van de kinderen is toegesneden.

B: Onze focus is nu ook op de leeftijd van 10-12, groep 7 en 8 omdat wij zelf ook al hadden bedacht van hé …

Maartje: En hebben jullie al een idee wat voor vragen jullie erin gaan zetten?

B: [een questionnaire, maar creatief, iets aantrekkelijker voor het kind om in te vullen]

Maartje: En wordt het iets wat geprint gaat worden of weten jullie dat allemaal nog niet?

N: [papier, digitaal overwogen, maar methoden zijn nu nog papier, dus meer gedoe om daar digitaal enquête aan te hangen]

Maartje: Tja, inderdaad als je alleen daarvoor weer een computer moet gaan aanzetten, tenminste, sommige scholen werken ook al heel veel met tablets maar niet alle scholen.

N: [dus overwogen, en voor toekomst heel goed]

B: [ook checklist voor docent, en kinderen: hebben ze vragen over het programma, kinderen niet leuk > dan ook geen verandering misschien?]

Maartje: Leuk! Ik hoop dat jullie wat antwoorden hebben gehad, ik ben inderdaad nog een nieuwelingetje, maar ik zal dit nog even navragen aan een collega of zij op de hoogte is van verdere programma's. Dan moet ze niet gaan googlen, maar wat ze gewoon uit haar hoofd weet, dat is jullie vraag toch? Zijn we ons er bewust van of er zulke programma's bestaan.

B: Dan wil ik u bedanken voor het interview!

Maartje: Graag gedaan! En misschien, ik weet niet of ik dat duidelijk heb gezegd, maar over interne evaluatie: dat doen we ook wel onder collega's, één van onze collega's die is daar super kundig in, dus die kan bijvoorbeeld ook naar zo'n programma kijken en nog suggesties geven over waar scholen mee bezig zijn, dus hoe je het beter kunt aanpassen naar hun lesprogramma en hun doelen en op zo'n manier probeert om ook wel intern het programma te optimaliseren.

N: Ik had nog een vraag op zich, over de uitvoering van programma's

Maartje: Ja, dat is wel één van de dingen waar we dat uit halen. Natuurlijk ook door de lessen zelf te geven en te ervaren: wat doet het nou en wat levert het op? Maar inderdaad ook door bij de docenten te checken.

N: Hoe vaak geven jullie zo'n les dan?

Maartje: Goeie vraag. Volgens mij gaan we ze nu in het najaar zo ongeveer zes keer geven, dan gaan we aanpassingen maken waar nodig en dan vervolgens wordt het gewoon verder verspreid.

N: Is dat deel 1?

Maartje: Nou in ieder geval het deel waar we nu mee bezig zijn: 'Wanneer vind ik het erg?' hebben we nu uitgewerkt. En dan vanaf januari moet het volgende deel weer er liggen. Dus we zullen steeds bij elk nieuw deel weer een paar gastlessen om het eventueel te kunnen testen.

Appendix 6 Response of one teacher (Dutch)

Wanneer heeft u het project Zwervend Afval uitgevoerd?

T: Maart 2016

Wat was uw algemene indruk van het project?

T: Leuk en leerzaam

Wat denkt u dat de organisatie met dit soort projecten wil bereiken?

T: Dat men minder afval op straat gooit en bewustzijn

Waar moet volgens u de focus op liggen in deze lessen?

Empowerment: Belangrijk

Kennis: Belangrijk

Normen en waarden: Heel belangrijk

Bewustzijn: Heel belangrijk

Attitude (Houding): Heel belangrijk

Plezier: Heel belangrijk

Gedragsoefening: Belangrijk

Het project heeft een eenmalig karakter, denkt u dat het haalbaar is dat een les kan leiden tot gedragsverandering?

T: Bij kinderen zeker, of ze het volhouden blijft de vraag.

Om effectiviteit te meten: Wat moet je volgens u meten om te zien of er een verandering van bijvoorbeeld gedrag of kennis is na zo'n les? Waar zie/merk je dat aan?

T: Het nogmaals aan de orde stellen

Wat zijn suggesties van uw kant, om de lessen effectiever te maken? Om bijvoorbeeld gedragsverandering en/of meer kennis te realiseren?

T: Geen idee

Worden projecten in het algemeen nu al geëvalueerd op effectiviteit?

T: Soms

Zijn er volgens u al methoden om gedragsveranderingen te meten bij kinderen?

T: Geen idee

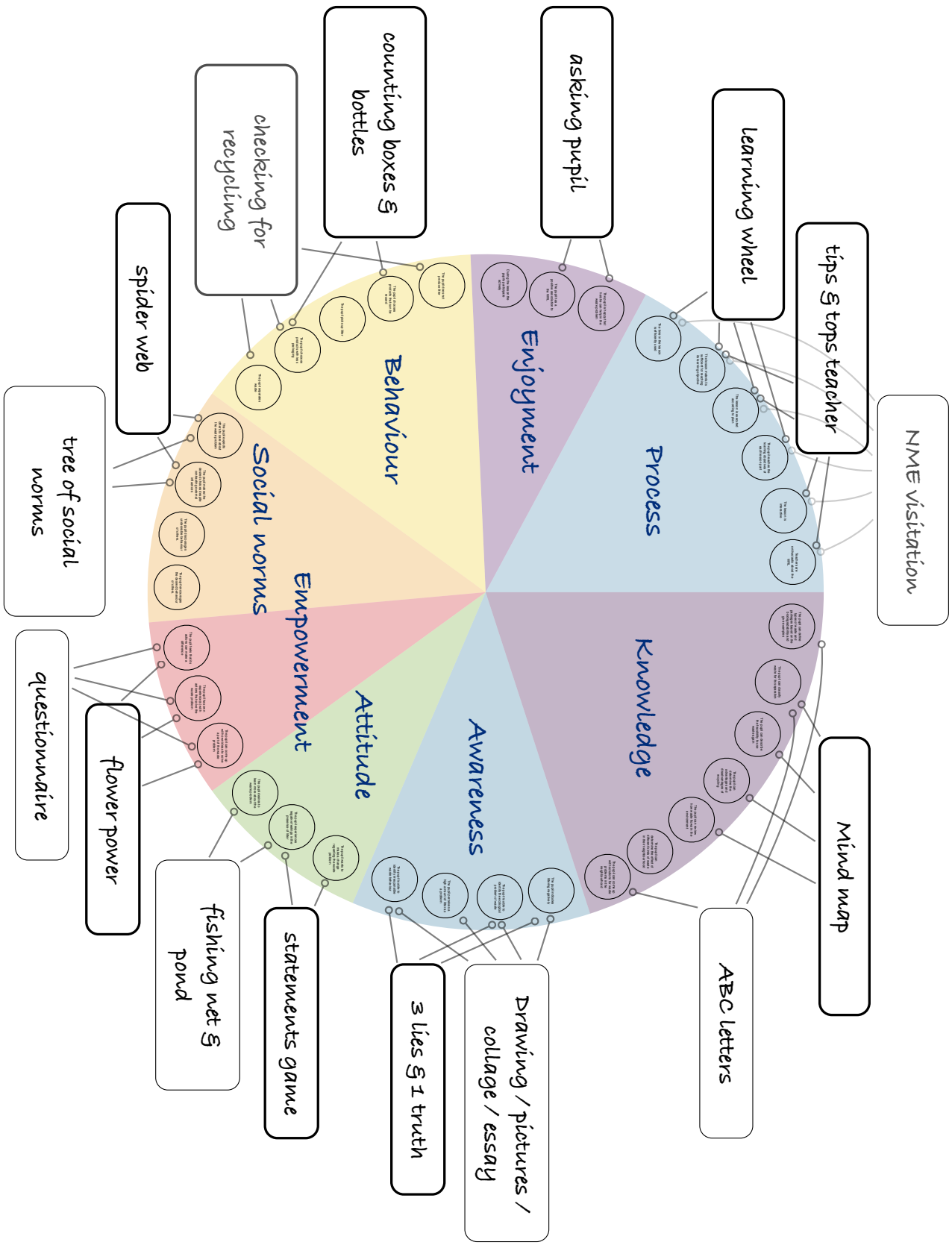
Hoe denkt u dat je het beste kan meten of er gedrags-verandering is?

T: Moeilijk te zeggen, zien in de praktijk

In welke mate en op welke manier is het voor u als leraar mogelijk (qua tijd) om gedragsverandering te meten?

T: Veel observeren, tijd altijd een probleem

Appendix 7 Circle of determinants, indicators and top-two tools



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