FACULTY OF EDUCATION
DEPARTMENT OF PEDAGOGICAL CURRICULAR AND PROFESSIONAL STUDIES

PRE-SERVICE TEACHERS' ATTITUDES TOWARDS EDUCATION FOR SUSTAINABLE DEVELOPMENT

AN EMPIRICAL STUDY AT THE UNIVERSITY COLLEGE OF TEACHER EDUCATION VIENNA/KREMS (KPH WIEN/KREMS)

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Master's thesis:	30 credits
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Supervisor:	Sally Windsor and Irma Brkovic
Examiner:	Hanan Innabi

Abstract

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Aim: The aim of the study was to find out what attitudes pre-service teachers at the University College of Teacher Education Vienna/Krems have towards education for sustainable development. What do they think, know and feel towards ESD?

Theory: The theoretical framework consists of the concept of ESD and attitudes as a psychological construct. Attitudes can have an influence on peoples' behaviour. In the educational context it can be argued, that the teachers' attitudes can have an influence on their teaching.

Method: A mixed-methods approach was applied in the study. Data was collected through an online-survey and through qualitative semi-structured interviews. Two data collections have been done separately, as well as the data analysis. In the end they were brought together. The analysis was done by means of descriptive statistics and content analysis.

Results: The study showed that pre-service teachers at KPH have positive attitudes towards ESD, but not in all areas. Especially the affective dimension was not only positive. The pre-service teachers think ESD is important, especially applying it in primary school. But they also expressed a strong wish for more ESD content during teacher education.

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List of Abbreviations

DESD	Decade of Education for Sustainable Development
ECTS	European Credit Transfer and Accumulation System
EfS	Education for Sustainability
ESD	Education for Sustainable Development
KPH	Kirchliche Pädagogische Hochschule Wien/Krems (University College of Teacher Education Vienna/Krems)
NGO	Non-Governmental Organisation
SDGs	Sustainable Development Goals
UNESCO	United Nations Educational, Scientific and Cultural Organisation

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1 Introduction

1.1 Initial Situation of the Study

In Austria primary school teachers are educated at the University Colleges of Teacher Education. These institutions are settled across all of Austria and offer different emphases for the pre-service teachers, for example inclusive education or religious education. However, the basic conditions are the same at all University Colleges of Teacher Education. The bachelor's degree program includes 240 European credit transfer and accumulation system (ECTS) points, and the master program has 60 ECTS points of study. Thus, the whole teacher education for primary school takes ten semesters to complete in the standard study schedule.

At the University College of Teacher Education Vienna (KPH) a course on *Grüne Pädagogik* (Green Pedagogy) is given as an elective course in the fourth semester of the bachelor's degree programme. This course explicitly mentions Education for Sustainable Development (ESD) as one of its emphases in the curriculum. In the master programme the students can also choose an elective course in the first semester that has an emphasis on ESD. Each of these courses brings two ECTS points of study. Thus, there are two courses on ESD within the ten semesters of teacher education that can be taken voluntarily (Kirchliche Pädagogische Hochschule Wien/Krems, 2019a, 2019b).

ESD is mentioned as one of the main ideas in the teaching, learning and evaluation concept (*Lehr-Lern-Beurteilungskonzept*) of the curriculum of teacher education (Kirchliche Pädagogische Hochschule Wien/Krems, 2019a). ESD is considered one of the basic skills that pre-service teachers should develop throughout their studies. It is assigned to the area of competence of *Verantwortlich leben* (living responsibly). The curriculum states that teachers should participate in the planning and implementation of school projects, in particular for social justice, for education for sustainable development and for the preservation of creation and peace (Kirchliche Pädagogische Hochschule Wien/Krems, 2019a). Interestingly however, is that the term ESD is not even mentioned once in the curriculum for primary school (Bundesministerium für Bildung, Wissenschaft und Forschung, 2012). This may be because the curriculum is dated. A new curriculum for primary school is a current work in progress and should be issued in the coming years.

This is the initial situation for this study: the context in which the pre-service teachers at KPH do not have many explicit points of contact with ESD. The basic conditions of their education

– according to the curriculum - do not offer them a wide range of engagement with ESD. The contact that they do have with ESD is limited, often voluntary and/or happens randomly.

This study investigated the attitudes of pre-service teachers at KPH towards ESD. Considering as de Haan argues: "In many cases, it's evident that ESD is mainly a question of attitude – of whether or not someone wants to engage with and promote it." (Deutsche UNESCO-Kommission) and inclusion of the concept in KPH teacher education curriculum, understanding attitudes towards ESD is important. If ESD is an important concept for pre-service teachers to know about, it should not depend on the attitude or personal interest of the pre-service teachers alone to seek ESD learning opportunities.

1.2 Research Aim and Question

In the light of its context and previous research in the field, the aim of this research project was to find out which attitudes towards ESD future teachers bring to the classroom. This is relevant, because attitudes can have an influence on the behaviour of the teacher with regards to ESD. As has been explained above, ESD is not explicitly mentioned in the primary school curriculum of Austria, thus, it depends on the teacher if s/he implements ESD in her/his teaching. It is therefore important to understand pre-service teachers' attitudes towards ESD, because they will one day be teachers who choose to include ESD, or not, in their classrooms.

Thus, the research questions for this master thesis are:

- What attitudes, knowledge and feelings do pre-service teachers at a large Austrian Teacher Education Institution have towards Education for Sustainable Development (ESD)?
- How do pre-service teachers see their future role as teachers regarding ESD and how do they view the ESD content they receive in teacher education?

1.3 Theory and Method

The main theoretical concepts this study is based on and framed by are ESD and attitudes. The concept of ESD has its origin in United Nation's engagement with sustainable development. Attitudes are a construct originally studied in social psychology and can be defined in various ways. A common definition was provided by Rosenberg and Hovland (1960) who suggest a three-component model to define attitudes. According to this model attitudes consist of an affective, behavioural and cognitive dimension.

A mixed-methods approach has been applied in this study. Data was collected through a quantitative survey and through semi-structured qualitative interviews with pre-service teachers at KPH. Both data sources were analysed separately with the help of statistical analysis and content analysis. In the end the results were brought together and discussed.

1.4 Contextual Limitations of the Study

This study was conducted during challenging contextual circumstances. In spring 2020 the whole world was concerned with the coronavirus pandemic. In Austria Universities switched their seminars for the whole summer term (which is from the beginning of March to the end of June) to distance-learning. People were not allowed to meet each other to avoid further spreading of the virus. That means, it was not possible to meet any pre-service teachers in person, or any other persons who could have been helpful during the data collection process. All the communication took part by e-mail, which presented challenges to getting responses or reactions. Therefore, the number of students who participated in the study was much lower than originally planned. The analysis was conducted on a quite small sample. What the contextual circumstances mean for the results of the study will be discussed within the discussion of the results.

Therefore, it is not possible to draw any conclusions for the whole population of pre-service teachers at KPH as the results are not representative nor generalizable. But the study offers important insight into their attitudes.

1.5 Ethical Considerations

A crucial part of this study was data collection involving participants. The interviews especially dealt with personal and individual stories, but the survey also revealed personal attitudes and opinions. Thus, the handling of personal information had to be very careful. Furthermore, the participants of the study had to be treated in a respectful way. Carefulness and delicacy were the golden rule of the study because of its sensitive issues.

Because this study was being conducted at KPH it was also important to consider and adhere to that institution's informed consent policy. All participants of the survey and the interviews offered their consent upon reading a form where they agreed that they: knew what the research project was about; knew the interviews were to be recorded; knew taking part was voluntarily; had the right to withdraw participation at any time; and, understood their data would be treated anonymously. Furthermore, they agreed to the data protection policy according to General Data

Protection Regulation of the European Union. The consent was given electronically. In the description of the interviews and the discussion of the results pseudonyms have been used for the names of the participants to ensure their anonymity.

1.6 Structure of the Thesis

The path through this thesis starts with a literature review to give an overview of the most relevant previous research in the field. The literature review will furthermore explain how the work in hand contributes to the field and describe the research gap. The theoretical frame will be described in chapter three. The main important concepts of the study are Education for Sustainable Development and attitudes. In chapter four the method of the study is described. Afterwards the results are presented and discussed in the following chapters. The final chapter concludes with the main results and gives recommendations for ESD practice at KPH and further research in the field.

2 Literature Review

2.1 Previous Research

Reunamo and Pipere (2011) state that "the research on ESD is a comparably new direction." (p. 111). It is an interdisciplinary research field, based in educational research but also in sustainable development.

Studies on teachers' or pre-service teachers' attitudes towards ESD have been conducted in various countries and contexts and with different emphases. This chapter provides a brief overview on some of the related research projects, their contexts, emphases, main findings and recommendations.

2.1.1 ESD-Courses in Teacher Education

One main approach of investigation into teachers' or pre-service teachers' attitudes towards ESD has been to research pre-service teachers enrolled in specific ESD courses (Andersson et al., 2013; Kyridis et al., 2005; Taylor et al., 2006; Tomas et al., 2017). In these studies, all the participants took part in an ESD course or a course considered to be related to ESD. In research by Andersson et al. (2013), Taylor et al. (2006) and Tomas et al. (2017) pre-service teachers were surveyed before the courses started and after they have finished it. In this way researchers investigated how the student's attitudes and knowledge about ESD had changed. Tomas et al. (2017) conducted interviews with pre-service teachers to get more information about this process and find out what caused the changes in the pre-service teachers' attitudes. Kyridis et al. (2005) also researched the pre-service teachers' attitudes after they completed a six months-long course on environmental education. In their survey they asked the pre-service teachers if they agreed or disagreed to 22 statements. This study differed from the previous three mentioned, as they did not conduct a comparative study.

These four studies revealed similar findings. Kyridis et al. (2005) explained that most of their participants had "already developed a positive attitude towards environmental education and have formulated particular views about how it is applied in Greek schools nowadays, as also about how they would prefer it to be applied in the future." (Kyridis et al., 2005, p. 62). Andersson et al. (2013) found positive effects of partaking in an ESD course compared to not partaking in such a course. After attending an ESD course pre-service teachers did not only see sustainable development as more relevant (Tomas et al., 2017), but can also demonstrated an increased environmental knowledge (Taylor et al., 2006). Taylor et al. (2006) recognised what

they described as a ‘concern-shift’. While the pre-service teachers were most concerned about “popular media-driven social issues” (Taylor et al., 2006, p. 49) before an Education for Sustainability- (EfS) course where pre-service teachers learned about important environmental issues, including socially critical components, they prioritised environmental sustainability issues afterwards. They found that the awareness for those issues increased and also that the concern about these issues increased as well (Taylor et al., 2006). It is interesting to note, that this research also detected that participating in this EfS-course did not make the pre-service teacher more pessimistic or even helpless. They argued “by offering a range of environmental teaching strategies, a sense of empowerment seemed to develop amongst the students.” (Taylor et al., 2006, p. 50).

An important point of discussion is the conclusions drawn that such programmes and courses should be installed in teacher education because of their positive effects. Tomas et al. (2017) argued that the inclusion of sustainability (in that case: EfS) courses is important because “pre-service teachers are open and willing to engage with EfS” (Tomas et al., 2017, p. 339). Kyridis et al. (2005) highlight the positive effects of attending only one ESD related course and point out the responsibility of universities “in developing the people’s interest in the environment.” (Kyridis et al., 2005, p. 62). Furthermore, they state the urgent need for an interdisciplinary curriculum to establish ESD within teacher education (Kyridis et al., 2005, p. 62). Shaukat’s (2016) research confirmed this need and found that pre-service teachers have a more positive attitude towards ESD if they have attended a specific course on ESD during their training. It found that attending specific ESD courses or courses that are related to ESD during teacher education has a positive effect on the attitudes of pre-service teachers, as well as increases the knowledge about ESD.

Spiropoulou et al. (2007) surveyed teachers about their attitudes towards and perceptions of ESD, and found that those teachers had a limited knowledge of ESD and were unfamiliar “with new methodological approaches which best promote a solid understanding of environmental problems.” (Spiropoulou et al., 2007, p. 448). They also found there were misconceptions about the term ‘sustainability’, and that often the teachers did not take global environmental problems into account, but only local and national ones. A more active role of universities regarding this problem is suggested (Spiropoulou et al., 2007).

Therefore, this study emphasises need for ESD courses during teacher education. Through ESD (related) courses, pre-service teachers would not only gain a deeper understanding of ESD, increase their knowledge about it and hopefully develop a more positive attitude, but they would

also become familiar with suitable methods of how to teach ESD in a classroom. Knowledge about didactics of ESD could empower pre-service teachers (Taylor et al., 2006), while the lack of such knowledge could create a feeling of helplessness (Spiropoulou et al., 2007). Ryan (2004) points out the little awareness of the pre-service teachers for the need for ESD. She also highlights the lack of knowledge about sustainability issues and argues for an urgent need for input for the pre-service teachers (Ryan, 2004).

A study that was not in a direct relation to an ESD course in teacher education was been done by Shaukat (2016). Her emphasis were demographic differences on the attitudes of pre-service teachers towards ESD. Shaukat (2016) investigated the attitudes of pre-service teachers towards ESD. Her sample consisted of pre-service teachers with various backgrounds and education. The main results state that male participants held more positive attitudes towards ESD than female ones and also the younger participants with a science background were more positive towards sustainable development (Shaukat, 2016). But Shaukat (2016) also points out, that pre-service teachers who have attended an ESD course during their education are more positive towards ESD. Her findings are compatible with the findings of the studies mentioned above.

2.1.2 Competencies and Perceptions in ESD

Cebrián and Junyent (2015) revealed in their study which competencies pre-service teachers prioritised in relation to ESD. Prioritised competencies are

> the acquisition of knowledge and practical skills related to nature and natural science, to the detriment of other types of learning, such as the promotion of ethical values, positive attitudes towards sustainability and the management of emotions among their future primary school students. (Cebrián & Junyent, 2015, p. 2781).

Regarding the role of the teacher in relation to ESD, pre-service teachers describe ‘taking responsibility’ and ‘having responsibility’ as key notions (Nikel, 2007). According to Evans et al. (2012) pre-service teachers understand education for sustainability as “(1) education that is continuous (long term); (2) education about ecological systems and environmental issues; (3) education that is active, hands-on, local and relevant; and (4) education for the future.” (Evans et al., 2012, p. 5)

These findings demonstrate various emphasises in ESD depending on the respective questions and aims of the research projects. It shows the broad variety of issues that are connected to ESD. For pre-service teachers’ or teachers’ attitudes towards ESD this means that it is not just a question of the attitudes towards one thing, but towards the various issues that are related to ESD. In a further research project, these various issues can be considered for example or a ranking of priorities can be surveyed.

2.2 Gap in Research and Relevance

There has been little research on ESD conducted in Austrian teacher education to date. An Austrian study on teachers'/pre-service teachers' attitudes towards ESD could not be found. Thus, in the light of previous research in the field this research project is an exception because of its specific context and situation.

The research project is an inquiry of the status quo of pre-service teachers' attitudes towards ESD at KPH. The findings may be relevant for KPH, for further development of the curriculum for the education of primary school teachers, for creating a different perspective on ESD, and for a deeper understanding on the pre-service teachers' perspective on ESD. Perhaps it will also be relevant in other ways that cannot be foreseen at the moment.

That means, the research project contributes to the research field by considering its specific context and it will be particularly relevant for the institution where the research is conducted.

2.3 Summary

Generally speaking, around the world teachers and pre-service teachers have adopted a more positive attitude towards ESD after partaking in an ESD course. Surveys on teachers' attitudes towards ESD without the context of an ESD course demonstrate their limited knowledge about ESD and unfamiliarity with appropriate methods for implementing ESD in their teaching. A main conclusion from these studies is, that it is important to include more ESD content in teacher education to give them the chance to increase their knowledge and engage deeper with it.

This research project is significant because it investigates a specific context and situation. In this way it contributes to the research field.

3 Theory

3.1 Education for Sustainable Development (ESD)

Education for sustainable development (ESD) as a phenomenon is almost entirely shaped by the United Nations and its United Nations Education, Scientific and Cultural Organisation (UNESCO). A basic definition of Education for Sustainable Development (ESD) is provided by Lenglet (2015) who explains that "the substance of ESD resides in the intimate connection between the content of sustainable development and the methods of education and learning." (Lenglet, 2015, p. 58). In this definition it is possible to see that ESD is constituted of three components: education/learning, sustainability and development.

Education in ESD is meant as formal and informal education and goes beyond what is learned in school highlighting life-long learning as one of the main characteristics.

Sustainable development is a term first used in the Brundtland report and was defined as "development that meets the needs of the present without compromising the ability of future generations." (World Commission on Environment and Development, 1987, p. 41) That means that current generations should have one eye on future generations and their needs. Sustainable development was a concept designed to respond to problems of global injustice (differences between the global North and the global South/developed and developing countries), poverty, global warming, biodiversity loss, progressing technologization. The Brundtland report addresses ecological, economic and social problems as roots for the need for sustainable development.

The current UN sustainable development paradigm is known as Agenda 2030 that has been agreed upon in 2015. Agenda 2030 sets out a plan for *'people planet and prosperity'* and provides 17 Sustainable Development Goals (SDGs) and 169 targets for the year 2030 to stimulate action in critical areas of importance to humanity and the planet. All the above-mentioned problems that have been recognised by the Brundtland-Report in 1987 are captured in these SDGs. They have very concrete descriptions of what needs to be done. All states of the world are called to act for reaching the goals. And although there are these individual goals, they all belong together and are interdependent.

The SDGs have become more central to ESD with the importance of education itself appearing as SDG 4 *Quality Education*. Target 4.7 explicitly mentions ESD:

> By 2030, ensure that all learners acquire knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human

> rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development. (UNESCO, 2017a, p. 8)

But ESD is not only part of the SDGs. It is furthermore seen as a key instrument for achieving the SDGs. ESD empowers learners to contribute to a sustainable development.

ESD was therefore conceptualised as the type of education that encouraged and facilitated "action to accelerate progress towards sustainable development." (UNESCO, 2017b, p. 25). In 2002 the United Nations declared the years 2005-2014 as the Decade of ESD (DESD) with the aim to implement sustainable development in all educational systems around the world. Following the DESD, the years 2015-2019 were shaped by the Global Action Programme for ESD. The current UNESCO ESD-program is called 2030 for ESD and specifically "aims to build a more just and sustainable world through strengthening ESD and contributing to the achievement of the 17 Sustainable Development Goals." (UNESCO, 2019). These programs show that UNESCO holds education as a driving force for change towards a sustainable future.

ESD has to be seen as a holistic concept, that is more than just learning content. ESD also addresses the learning outcomes and pedagogy. "It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity and the linking of formal and informal learning." (UNESCO, 2017a, p. 7). Thus, ESD has an emphasis on its holistic aspect as well as its transformative aspect.

However, many scholar have been critical of the notion of ESD as holistic and transformative (e.g. Ideland & Malmberg, 2015; Jickling, 1994).

Ideland and Malmberg (2015) have analysed teaching material through the lens of Foucault's concept 'pastoral power', whereby salvation, sacrifices, guilt, soul, the 'whole life', and the relationship between the individual and the flock served as analytical instruments. The results were quite critical:

> [T]he discourse of education for sustainable development is characterized by scientific and mathematical objectivity and a faith in technological development and consumption. It emphasizes the right of the individual and the obligation to make free - correct - choices, but also that individuals are responsible to the global community, both now and in the future. The discourse is expressed in an interesting combination of seemingly objective mathematical statistics and emotional - almost religious - expressions like 'our common future', 'save the world', and 'coming generations'. It is a neoliberal rationality, operating through pastoral power. This is a way of governing souls into 'reason' and adaption to market economical ideals. With the help of education for sustainable development, an economic discourse becomes dressed in a poetic and irresistible language. (Ideland & Malmberg, 2015, p. 181)

Considering the aim of ESD, another critical perspective asks: “Is it the job of education to make people behave in a particular way?” (Jickling, 1994, p. 114). Jickling argues, derivated from the Brundtland-Report *Our common future* (World Commission on Environment and Development, 1987) that sustainable development is seen as a common interest and everybody is responsible for achieving it. Thus, he further argues that he would prefer teaching students *about* sustainable development then educating them *for* sustainable development. Students must know the arguments but decide for themselves. “In a rapidly changing world we must enable students to debate, evaluate, and judge for themselves the relative merits of contesting positions." (Jickling, 1994, p. 116)

Thus, critical perspectives on ESD are mainly concerned with its value-based notion, respectively with the notion that sustainable development is a common achievement of humankind that should bother every human being.

3.2 Attitudes

3.2.1 Social-Psychological Foundations

Attitudes are usually researched in social psychology. There are a number of definitions of attitudes. Some models define it as a one-dimensional concept, while others understand attitudes as multi-dimensional. A definition as been proposed by Rosenberg and Hovland (1960) is used in this study. They suggest understanding attitudes best as a model consisting of the three dimensions: affect, cognition and behaviour (Rosenberg & Hovland, 1960). The cognitive aspect deals with beliefs, opinions, knowledge and judgments of a person towards an object. The affective aspect deals with the emotions of a person towards a subject and the behavioural aspect is concerned with the readiness, intention or tendency to act. The three aspects of attitudes are connected, interdependent and influence each other. Thus, they can be seen as a system (Barry, 2014).

Social psychologists generally agree upon the function of attitudes, which is to allow an oriented, coordinated and consistent action towards an object (Fischer & Wiswede, 2009). Furthermore, there is agreement on how attitudes develop from experiences and learning processes. Although attitudes are relative resistant to change, new experiences or learning processes can influence them and even cause a change of the attitudes (Bornewasser et al., 1979).

Although various models about the relationship of attitudes and behaviour exist, there is no general agreement upon this relationship. What is clear, is that attitudes have a direct or indirect

influence on the behaviour of a person, but it is not possible to predict the behaviour of a person based on his/her attitudes. That is, because there are too many other factors that influence the behaviour of a person (Barry, 2014).

Thus, an engagement with ESD content during teacher education may not automatically lead to the implementation of ESD in the future teaching. For this transition other factors play important roles too.

3.2.2 Attitudes in Education

Evans et al. (2012) found "that what teachers know, think and believe directly affects classroom content and pedagogy." (Evans et al., 2012, p. 3) The same premise will be used for this study. Evidence that supports this premise can be found for example in Nespors' (1987) and Pajares' (1992) research about teachers' beliefs.

Nespor (1987) argued about the major role of teachers' beliefs in education. Beliefs influence how teachers define teaching tasks and how they organise their knowledge and information that is relevant to those tasks. That is because "the contexts and environments within which teachers work, and many of the problems they encounter, are ill-defined and deeply entangled, and that beliefs are peculiarly suited for making sense of such contexts." (Nespor, 1987, p. 324) Furthermore, Nespor (1987) argues that if we want to understand what teachers do, we have to look at subjective interpretations of the tasks. In general, he supports the claim that what teachers think and how they understand their practice essentially influences their practice. Pajares (1992) also emphasises this connection between teachers' beliefs and their actions they take in a classroom and in their personal lives.

Finally, it is not attitudes alone that influence the teachers' willingness and openness to implement ESD. There are other circumstances (e.g. policy, school community's preferences and expectations) that need to be considered too. Evans et al conclude that "in environmental/sustainability education, practices are shaped by teachers' personal and other theories, which are built into the institutions in which they work." (Evans et al., 2012, p. 3)

3.3 Summary

ESD is a holistic approach, outlined by the UNESCO - that covers all aspects of learning – people, planet and prosperity and has a strong connection with the SDGs. A main feature is its transformative aspect where it is seen as a powerful tool for achieving sustainable development.

Attitudes are a construct in social psychology. A common definition has been provided by Rosenberg and Hovland (1960), who describe attitudes as a three-component-model consisting of affect, cognition and behaviour. Attitudes do influence the behaviour of a person in any way. Thus, the attitudes of a teacher can have an influence on his/her behaviour in a teaching situation.

The presentation of ESD and attitudes is the departure point for further investigation, that also helps creating survey items and an interview guide for the study. This theoretical frame will be useful in the discussion of the results. It will help contextualising the results of the empirical study. The model of Rosenberg and Hovland (1960) will be used for the definition of attitudes, and also for the analysis of the results.

4 Method

4.1 Mixed-Methods Approach

For the study in hand a mixed-methods approach was chosen. This is, because the quantitative data would provide a good basis and lead to a broader picture of the pre-service teachers' attitudes while the qualitative data would complement this picture by adding more personal and individual stories, views and perceptions about ESD. Reunamo and Pipere (2011) argue that "Mixed methods serve as an important bridge across disciplines providing a synergistic approach to research design in which the different methods inform one another." (p. 119). The mixed methods approach helps understanding the attitudes towards ESD on different levels. The survey sought to know if pre-service teachers thought ESD was interesting or important and their opinion to pre-defined statements. The interviews on the other hand gave insights into more personal conceptions.

Attitudes are most often surveyed within quantitative methodological approaches, where participants have to react to statements with agreement or disagreement. In many cases attitudes are measured with a Likert-scale or a Thurston-scale (Barry, 2014). Researchers in this field often argue for using a questionnaire or survey as the most suitable method to find out about attitudes of (pre-service) teachers (Andersson et al., 2013; Cebrián & Junyent, 2015; Kyridis et al., 2005; Shaukat, 2016; Spiropoulou et al., 2007; Taylor et al., 2006). Kyridis et al. (2005) argued that the use of a questionnaire meant they could reach more participants and stimulate their interest.

A qualitative approach with individual interviews can be added to quantitative data about attitudes in order to deepen understanding individual perceptions and attitudes towards ESD (Nikel, 2007; Tomas et al., 2017). Tomas et al. (2017) showed that conducting interviews beside a survey to find out about the reasons of possible changes in the attitudes of students was effective and allowed participants to talk about particular aspects in depth. Ryan (2004) also used a qualitative approach by conducting interviews in addition to surveys. Her main argument for this decision was to "identify, describe and understand individual perceptions and seek insight rather than focus on statistical analysis." (Ryan, 2004).

To sum up, research projects are designed according to the needs and aims of the studies. There are advantages and disadvantages of the methods that have been used. If one wants to gather a lot of information from many people, it makes sense to use a survey as research method. To design such a survey can be time-consuming, but the survey can be adapted after piloting. A

disadvantage of using a survey instrument is to not be able to ask the participants again if one does not understand an answer or wants to know more about it. By doing interviews it is possible to seek insight into individual attitudes and motives and the researcher has the chance to not only ask fixed questions, but also more and other questions to gain a deeper understanding. This can be especially helpful with such a personal issue as attitudes towards ESD.

4.2 Survey

4.2.1 Description of the Instrument

For the collection of the quantitative data a short questionnaire was constructed. The first more general items asked for the age of the participant, gender, field, level and term of study and the special focus the participant has chosen in his study. The main part of the questionnaire is a scale measuring attitudes towards ESD that consists of fifteen items, which are statements about ESD. The participants were asked to state how much they agree with these statements on a scale from 1 to 4, where 1 means *strongly disagree* and 4 means *strongly agree.*

The statements covered various issues in connection with ESD (see appendix 1). Some items have been adapted from Tomas et al. (2017). Their study looked at pre-service teachers' change of attitudes towards ESD after partaking in an ESD course. The other items were created seeking responses to the research questions. The creation of the survey took some time and intensive revision. The scales of similar studies have been considered and drawn upon in this process as well as continuous correlation with the research questions of the actual research project. A pilot study with N=5 was conducted to check if the instrument was understood by the participants. Content validity of the items was reviewed by one university teacher that is an expert in sustainable development education and one university teacher that is a psychologist.

4.2.2 Data Collection Process

After creating the questionnaire in English, it was translated into German which is the official language in Austria. The survey was converted in an online-tool (https://www.soscisurvey.de) and posted on the Facebook-page of the students' union of KPH. Additionally, the heads of the Departments of Pre-Service Teacher Education in Vienna and in Krems were asked to send out the link via e-mail to all students. But they responded that they do not send this kind of e-mail to all students. The students' union could do this, but they only posted the link on their Facebook-page. On the first page of the survey was a short text with an introduction,

instructions for completion of the survey and the informed consent. The participants had to agree to this informed consent in order to get to the first page of the actual survey. In addition, my e-mail address could be found on this page for any further questions.

4.2.3 Sample

In total, 90 participants started the survey. Only answers from participants that completed the whole questionnaire were included in the analysis. Some pre-service teachers skipped the survey after the first or second page (out of three). In total 40 pre-service teachers completed the survey.

The pre-service teachers that took part in the survey were between 18 and 46 years old, most of them were between 22-24 years old (M_{age} = 24,63, SD = 5,16). The majority of the participants (38) were female and most of them (37) are studying the teacher training program for primary school, the others are studying the upgrading program. At bachelor level are studying 29 of the participants, while 11 are studying at master level. They are in different terms in the course of their study (see Table 1)[1]. Pre-service teachers from all the different special foci took part in the survey. Many of them (n = 7) took *Humans in Society, Culture, Time and Space* as their special focus of study.

Table 1

Distribution of Term at Bachelor and Master Level

		term						total
		1	2	3	4	6	8	
level	bachelor	0	5	0	9	9	5	28
	master	1	7	1	0	0	0	9
total		1	12	1	9	9	5	37

In summary the sample consisted of pre-service teachers at bachelor and master level from different terms in the course of their study with various special foci of their studies. It has not been asked if the participants took part in one of the elective ESD courses during their teacher education. Thus, this has not been taken into account in the research.

[1] Three of the pre-service teachers at master level did not state at which term they are studying.

4.2.4 Analysis

In order to answer the research questions descriptive statistical procedures were applied. These analyses were conducted on the item level and the items were grouped based on their content. The latent structure of the scale is unknown and scale results were not calculated. Latent structure analysis was not performed due to the small data set (Tabachnick & Fidell, 2007).

The data was imported from the online-survey tool to SPSS (version 26) and the analysis was done with the help of the program.

4.3 Interviews

4.3.1 Description of the Instrument

For collecting the qualitative data, a semi-structured interview guide (see appendix 2) was developed. It consisted of five guiding questions. The interview guide started with an icebreaker-question where the participant was asked to just think of ESD and describe what comes to his/her mind. In the next step the participant was asked about his/her personal interest in ESD. The two main questions addressed ESD as perceived in their teacher education studies, and the future implementation of ESD in their own teaching. In the end the participant had the chance to add further thoughts or comments about ESD if s/he wanted to do so.

4.3.2 Data Collection Process

The interview guide was translated into German and interviews were both conducted and analysed in German.

In the online survey it was noted on the last page that participants for qualitative interviews were sought. And if anyone was interested, they could make contact via e-mail. No one responded to this invitation. At the same time, I asked a teacher at KPH to help me find participants because I did not know the students. She was my gatekeeper for this data collection process. I received some names from her and contacted the students to ask for participation in the research project.

All contact with the participants was done online via various tools like e-mail and skype. Before the interviews took place, the participants sent me a signed informed consent form, they had the chance to ask questions and, importantly, they took part in the online survey.

4.3.3 Sample

Four primary school pre-service teachers took part in the interview study.

Ann is a student at bachelor level, studying the final courses of the program. During her study she did not take part in any course that had an emphasis on ESD. Ann said she did not get in contact with ESD at KPH but heard about it during her work for an NGO.

Lucy is a student at master level. She is already teaching at a school as a class teacher of a class at first grade. [2] She has not heard about ESD until a few months ago. And she had no time since then to engage herself deeply with it. But she says she is very interested in it and wants to implement it in her teaching. She has never heard about the concept of ESD during her studies at KPH before she started the master program.

Isabella is also studying at master level. She had her first contact with ESD a few months ago when she started the master program. There she took part in a voluntarily course that had ESD content. Beside her studies she is also already teaching at a school as a team teacher.

Susan is a student at master level, beside her study she is already teaching at a school. During her bachelor study she took part in a voluntarily course that was concerned with ESD. In her bachelor thesis Susan engaged herself with sustainability in teaching from a specific point of view. At the moment she is working on her master thesis that has also an emphasis on ESD.

4.3.4 Scope and Characteristics of the Interview Data

The data consists of four audio files with a length of about 20 minutes each. All files have been transcribed into text files. They consist of 20 pages with 53.895 characters in total. These texts are the basis for the analysis. All interviews were conducted and transcribed in German. The analysis was therefore conducted on German transcripts. All translation of transcripts and the results was been done by me.

4.3.5 Analysis

The interview data was subject to content analysis, which is a common method for the analysis of various kinds of text. According to Mayring (2015) content analysis aims to proceed in a systematic, rule governed, theory driven way to draw conclusions about specific aspects of communication.

The data within the interview transcripts was analysed by using an inductive development of categories. That means that the categories in which the elements were classified were developed

[2] In Austria after finishing the bachelor program, pre-service teachers can start teaching at a school, but have to finish the master program too to be fully approved as a teacher.

out of the data itself. Thus, the data within the interview transcripts was coded. This was done with using the steps suggested by Mayring (2015). The concept of summarizing content analysis occurs in a process that contains the following steps: definition of what has to be analysed (selection criterion based on the research questions); definition of the level of abstraction (how concrete or abstract should the categories be?); work through the material; formulate categories; subsumption or development of new categories; revision of the categories after 10-50% of the material has been analysed; final run through the material; interpretation and analysis (Mayring, 2015).

That means, the material was analysed selectively, searching for attitudes of the participants based on the model by Rosenberg and Hovland (1960). The definition of the categories was: subjective attitudes, perceptions and opinions towards ESD in relation to teacher education, their own (future) teaching and personally. As the level of abstraction was defined to name concrete statements and arguments about ESD. Thus, the leading question for the analysis was: What do pre-service teachers think, know and feel towards ESD? This question is based on the model of Rosenberg and Hovland (1960), where *think* and *know* belong to the cognitive dimension of attitudes, while *feel* belongs to the affective dimension. There is no explicit question about the behavioural dimension, because it is connected with the other dimensions, as the three dimensions represent a system (Barry, 2014).

4.4 Research Process

The research process, especially the developing of the instruments was not a linear process. I repeatedly returned to the research questions and the previous research, but also to the theoretical framework and there was a continuous adaption on all levels. But the initial researchs question remained the guide in this process.

Finding participants for the research project and distributing the online survey were influenced by contextual circumstances, as personal contact was completely restricted because of the coronavirus pandemic. All educational institutions were closed and conducted distance teaching and learning. KPH was closed and it was not possible to meet university teachers, participants or other persons that could have supported the research process. The whole communication with participants and gatekeeper was done online, mainly via e-mail.

The survey was published online during five weeks and weekly reminders to participate were sent. Yet the number of participants was quite low. I asked several colleagues in different departments but could not find a way to send the link of the survey to all pre-service teachers

at KPH. The main way of communicating the link was via e-mail to pre-service teachers I know personally, teachers that sent the e-mail to their students and the Facebook-page of the student's union. At the same time as I conducted my study there were two other studies that investigated how the students deal with the distance-learning situation that had arisen with Covid 19. This could indicate that there was some kind of overload of surveys and it was more important for the students to give their opinion about distance-learning because it affected them more immediately and directly.

Both data collection processes have been done simultaneously because they complemented each other. While the quantitative survey was online, the qualitative interviews were conducted and analysed. Afterwards the quantitative data was analysed.

4.5 Reflection

During the research process the main issues I pondered was if the interview questions and the questions in the instruments really measure what they should measure. I was sure to keep my original research questions and adapted the instruments again and again. In this process it became clear what the instruments could and should really measure and how this could be done. It was not only a process of development but also a learning process for me.

An interesting observation in the quantitative data collection process was that some participants answered only the personal questions about their age, gender and study but skipped the actual main questions about their attitudes towards ESD. This suggests a revision of the survey instrument, specifically the way the questions were presented to make it more interesting for the participants.

The interview-guide was a good tool that allowed for flexibility during the interviews. It was not only possible to skip questions because the participants already answered them, but also to add questions if it was of interest. However, it became obvious that at the beginning it was necessary to not only ask what the participants think of when they think about ESD, but also ask for a definition. It is important to have a common agreement about what we are talking about. And the first question is not enough for that. As a part of instructions related to attitudes scale there should also be a brief definition of what ESD is to also establish a common agreement of what it is.

I believe both instruments were suitable for answering the research questions. The survey generated an overview on the pre-service teachers' attitudes, while the interviews gives more insights into personal stories. And both ways complement each other in a very good way.

4.6 Summary

The study was conducted as a mixed-method study. Attitudes are usually surveyed with the help of quantitative methods, but to gain deeper insight, qualitative methods have been added. Quantitative data was collected through an online survey, while qualitative data collection was conducted with the help of interviews. Both processes ran at the same time, have been analysed separately and brought together in the end. In the following chapter, the results of the analyses are presented.

5 Results

5.1 Results of the quantitative data analysis

The questionnaire was answered by 40 pre-service teachers. They responded to 15 different statements about ESD.

Pre-service teachers most strongly agree with the items *Teachers can play an important role in solving sustainability-oriented challenges through education*, *It is important to include ESD in pre-service teacher education programs* and *It is important to include ESD in my future classroom practice* and it is remarkable that none of participants disagreed to those items. On the other hand, the items *It is not necessary for teachers to engage with ESD* and *ESD is a fad that will pass in time* were mostly disagreed, but some participants also agreed to them (see appendix 3).

5.1.1 Familiarity, Importance and Interest

As table 2 shows, 37,5% of the participants disagree or strongly disagree that they are familiar with ESD, while more than 60% of them state that they are familiar with ESD.

Even though some pre-service teachers are not familiar with ESD, nearly all of them agree or strongly agree that ESD is important and interesting to them. One person disagreed. A remarkable difference between these two items is the level of agreement. While for the importance of ESD strong agreement is slightly higher (50%) than agreement (47,5%), for the interest in ESD strong agreement is lower (37,5%) than agreement (60%).

Table 2

Descriptive Analysis of Items Related to Familiarity, Importance and Interest

item	mean	sd	Percentage of participants			
			strongly disagree	dis-agree	agree	strongly agree
I am familiar with ESD	2,68	0,730	5,0	32,5	52,5	10,0
ESD is important to me	3,48	0,554	0,0	2,5	47,5	50,0
ESD is interesting to me	3,35	0,533	0,0	2,5	60,0	37,5

5.1.2 Confidence and Ability to Cope

Two items dealt with the confidence of the participants in applying ESD in their teaching and the confidence in communicating ESD to others. Table 3 shows that 67,5% of the participants are confident about applying ESD in their teaching. Confident in communicating ESD to others are 50% of the participants. Thus, the confidence in applying ESD is slightly higher than the confidence in communicating ESD.

Out of all participants 77,5% state that they feel able to cope with understanding what ESD is while 72,5% of the participants state that they feel able to cope with imparting ESD. It is interesting to note, that the number of strong disagreements is obviously higher for the inability to cope with understanding what ESD is than for imparting ESD. Together with the findings about the pre-service teachers' confidence in applying and communicating ESD this could be a hint that pre-service teachers feel more certain about the application of ESD than about the understanding and communication of ESD.

Table 3

Descriptive Analysis of Items Related to Confidence and Ability to Cope

item	mean	sd	Percentage of participants			
			strongly disagree	dis-agree	agree	strongly agree
I feel confident in applying ESD in my teaching	2,80	0,911	10,0	22,5	45,0	22,5
I feel confident in communicating ESD to others	2,53	0,847	10,0	40,0	37,5	12,5
I am unable to cope with understanding what ESD is	1,98	0,891	32,5	45,0	15,0	7,5
I am unable to cope with imparting ESD	2,20	0,791	15,0	57,5	20,0	7,5

5.1.3 Unnecessary and/or a 'Fad'

The items about ESD as being unnecessary for teachers and ESD as a fad have the lowest mean of all items, indicating the lowest levels of agreement of all statements. Only 7,7% of the pre-service teacher state that it is not necessary for teachers to engage with ESD (see table 4). Most

of them strongly disagree to this statement (72,5%). Likewise, 7,5% think that ESD is a fad that will pass in time.

Table 4

Descriptive Analysis of Items Related to Unnecessary and/or a 'Fad'

item	mean	sd	Percentage of participants			
			strongly disagree	dis-agree	agree	strongly agree
It is not necessary for teachers to engage with ESD	1,38	0,782	74,4	17,9	2,6	5,1
ESD is a fad that will pass in time	1,45	0,639	62,5	30,0	7,5	0,0

5.1.4 ESD in the Classroom

The items about ESD in the classroom deal with statements about the role of teachers regarding sustainability-oriented challenges, the importance of including ESD in the own classroom and the will to implement ESD in the own classroom.

Outstandingly, *teachers can play an important role in solving sustainability-oriented challenges* and *it is important to include ESD in my future classroom practice* are two of the three items that all participants agreed with to some extent. Therefore, they have the highest mean agreement of all items. From all of the participants 57,5% even strongly agree that teachers can play an important role in solving sustainability-oriented challenges (see table 5). Strong agreement to the important of including ESD in their classroom practice expressed 52,2% of the participants. The majority of the pre-service teachers are also willing to implement ESD in their future teaching practice, only 5% disagreed to that statement.

Table 5

Descriptive Analysis of Items Related to ESD in the Classroom

item			Percentage of participants			
	mean	sd	strongly disagree	dis-agree	agree	strongly agree
Teachers can play an important role in solving sustainability-oriented challenges through education	3,58	0,501	0,0	0,0	42,5	57,5
It is important to include ESD in my future classroom practice	3,53	0,506	0,0	0,0	47,5	52,5
I will implement ESD in my future teaching	3,35	0,580	0,0	5,0	55,0	40,0

5.1.5 ESD in Teacher Education

The final items include statements about ESD in the teacher education. Participants agreed with the items to a high extent which can be seen at their high mean. The item *it is important to include ESD in pre-service teacher education programs* belongs to the three items that all participants agreed with. 55% of the participants strongly agree that it is important to include ESD in pre-service teacher education programs (see table 6). But most of the participants also think that there should be more ESD content during teacher education. 90% agree or strongly agree to this. Most of the participants (90%) also agree that the inclusion of ESD in their pre-service teacher grogram will directly benefit their ability to teach students about sustainability.

Table 6

Descriptive Analysis of Items Related to ESD in Teacher Education

item	mean	sd	Percentage of participants			
			strongly disagree	dis-agree	agree	strongly agree
It is important to include ESD in pre-service teacher education programs	3,55	0,504	0,0	0,0	45,0	55,0
There should be more ESD content during teacher education	3,40	0,672	0,0	10,0	40,0	50,0
The inclusion of ESD in my pre-service teacher education program will directly benefit my ability to teach students about sustainability	3,30	0,648	0,0	10,0	50,0	40,0

5.2 Results of the qualitative data analysis

Semi-structured interviews were conducted with four pre-service teachers. They have been analysed with coding. The leading question for the analysis was: what do pre-service teachers at KPH think, feel and know about ESD? Altogether twelve categories could have been found.

Table 7

Categories of Content Analysis

ESD is a necessity and a teaching mission
ESD deals with the SDGs
Wish for more ESD content during teacher education
Feeling overwhelmed and stressed
Sustainability as a personal concern
ESD deals with ecological issues
ESD is learning for life and relevant for everyday life
ESD content depends on the teacher
ESD is not always obvious in primary school classrooms
Influences from the family environment
ESD is diverse and broad
Personal interest is a requirement

The categories can be sorted according to the three aspects – what do the pre-service teachers think, know and feel towards ESD. Although it has to be noted that in some cases there is no clear line between the aspects and categories may fit into more than just one of the aspects. This is a more superficial order to give a summarising overview of the categories. There is no category called *ESD is important* or *ESD is interesting* because I was concentrating on the reasons for the interest and importance of it to get a deeper insight and to actually highlight the reasons behind the importance and interest.

The category that deals with what the pre-service teachers feel is *feeling overwhelmed and stressed.* It is the only category that directly addresses the feelings of the pre-service teachers.

The knowledge of the pre-service teachers about ESD is directly addressed in *ESD deals with the SDGs, ESD deals with ecological issues* and *ESD is diverse and broad.* Knowledge is of course also covered in the other categories, but these three categories address it directly.

What the pre-service teachers think about ESD gets obvious in the categories *ESD is a necessity and a teaching mission, wish for more ESD content during teacher education, ESD is learning for life and relevant for everyday life, ESD content depends on the teacher, ESD is not always obvious in primary school classrooms* and *personal interest is a requirement.*

The categories *sustainability as a personal concern* and *influences from the family environment* do not directly address ESD, therefore they are not included in the list above.

The most prominent category is *ESD is learning for life and relevant for everyday life.* This category has been mentioned 18 times and by all four pre-service teachers. This indicates that it is a very central and important point. Under the top three of the categories are furthermore *sustainability as a personal concern* and *ESD content depends on the teacher.* Both have been mentioned six times and by three out of four pre-service teachers. Three of the twelve categories have only been mentioned by one of the pre-service teachers. This does not mean, that they are not important. But in this rather small sample they play a minor role (see appendix 4).

In the following description of the categories, they are combined to themes that have emerged in the interviews. The preservice teachers spoke about a) what ESD meant to them as future teachers and what they had seen in schools, b) their understanding of and exposure to ESD more broadly, and c) how ESD relates to their lives.

5.2.1 Meaning for Future Teachers and Experiences in Schools

ESD Deals with Ecological Issues

Talking about important ESD issues some of the pre-service teachers talked about ecological issues. The production of energy, climate change, sustainable consumption and how to deal with our resources were named as most important issues. Interestingly, Susan and Isabella mentioned food first, how to eat regional and seasonal. But how to reduce waste was also mentioned as an important issue. The pre-service teachers located these issues within the subject of general education in primary school.

It is interesting to note here, that Ann was the only one who did not mention ecological issues explicitly. Her focus was on social sustainability.

ESD deals with the SDGs

The SDGs were mentioned once by Isabella when we talked about what she first thinks of when she thinks of ESD. The SDGs are very prominent for her, because she recently started to engage herself with it. In other interviews the SDGs were mentioned only in subordinate clauses, but as something that belongs to ESD.

ESD is Diverse and Broad

The pre-service teachers did not only mention concrete ESD issues as important during the interviews, but they also explained what a big and diverse concept ESD is. Isabella explained that it is "a very widespread issue" (Isabella) when she was asked about what she first thinks of when she thinks of ESD. To her it is clear that ESD covers various subject areas, it is not limited to a few issues.

Susan stated that ESD crosses all grades and subjects, it is not limited in that way. In her opinion ESD is not only part of the actual teaching, but also in other aspects of school life. She explained:

> But I think that you can bring that in a lot of different subjects. Thus, I would do it from the first to the fourth [grade], always a bit. So that it happens again and again and is an important part of school life. I don't know, even during the break, for example, that the children separate their waste, such simple things. (Susan)

Feeling Overwhelmed and Stressed

When asked about how they feel when they think of ESD, the pre-service teachers explained that they feel stressed or overwhelmed by ESD when they think about it. This is because ESD is such a broad issue. Isabella stated:

> At a first glance it seems a bit overwhelming, because the topic is so extensive. It is sustainability in general the term that is not really clearly defined. Thus, I would say that I am feeling overwhelmed first, I have to admit honestly. But if you take a closer look at it, I find it very useful. But the first thing is overwhelming. Then definitely interest and motivation to do this in class. (Isabella)

In this short paragraph Isabella mentioned three times that she first feels overwhelmed when she thinks about ESD. Later she also mentioned how important it is for her to be careful with ESD content in school, because she does not want the children to feel anxious. The children shall "not be put in a doomsday mood, you should not frighten them too much with it" (Isabella), she argued. Isabella does not want the children to feel uncomfortable with it. Therefore, she said, it is important to be careful how you teach it.

Ann and Lucy also said that they felt stressed when they thought about implementing ESD in their teaching. Lucy argued:

> Therefore, since this is also a very important topic for me, I would say, maybe it will stress me a little bit, because I want to do it well, because I want the children to take as much of it as possible. (Lucy)

Lucy also talked about how she just recently learned about ESD and wanted to implement it immediately in her teaching because it is important to her. But then she realised: "That immediately overwhelmed me." (Lucy) This was because of the "diverse possibilities" (Lucy) and "how big that is." (Lucy)

In the arguments of the pre-service teachers it gets obvious that ESD makes them feel overwhelmed and stressed because of their understanding of ESD as a diverse and broad issue.

ESD Content Depends on the Teacher

The pre-service teachers critically remarked that it depends on the classroom teachers if they bring ESD content to the classroom or not. According to them that is true for primary school as well as for KPH. They noted that they had observed during their teacher education that only those teachers (be it in seminars at KPH or in the practical studies) who are interested in ESD appeared to implement it in their teaching. Isabella said for example: "Everything is very dependent on the teachers, whether they give us an understanding of it or not" (Isabella). And Susan remarked: "There are just one or two professors that I had, and you can tell that they care about it themselves" (Susan). Susan explained that those professors she was talking about introduced ESD explicitly and she felt that they are interested themselves in ESD and therefore implemented it in their courses.

ESD is not always obvious in Primary School Classrooms

The pre-service teachers not only argued that it depends on the teachers if they implement ESD or not, but that ESD is not always obvious in primary school classrooms, based on their own experiences. They stated that they wish to have more ESD content in primary schools. While

they have been at schools during their practical studies or because of their own teaching they observed that there is not much ESD content happening. Ann states for example:

> And I think that it is a little bit anchored in the curriculum anyway, only in practice it is far too less or is not present at all and I think there can be done some revision [of the curriculum] on the political level. (Ann)

Ann suggested that more ESD content should be anchored in the curriculum.

Susan was quite critical about that aspect too. She said that even though ESD is an important part of education:

> But I have the feeling that there is far too little going on in schools. Also related to the question you asked earlier, whether I was faced with this in the practical studies and considering that I was just about in 16 different schools and never got anything to ESD, it is terrifying, I think. (Susan)

To her it is out of all reason why there is not more ESD content in schools because it is such an important issue. But she also sees her own duty to be a role model for other teachers. She argued: "Therefore it is even more important for me that I want to bring this into my school and also for all teachers that all teachers understand this and are familiar with it" (Susan). Susan sees the problem, that there is far too little ESD content at schools in her opinion, but at the same time she wants to take the chance to make other teachers familiar with it.

5.2.2 Understanding of and Exposure to ESD

ESD is Learning for Life and Relevant for Everyday Life

A main issue for all four pre-service teachers was that ESD is learning for life or put another way it is something that is relevant for everyday life. This was not only mentioned by all four pre-service teachers, but also mentioned often throughout the interviews. They each described it in a slightly different way and with different emphases.

Isabella stated that she will teach issues that have to do with the "reality of life of the children" (Isabella). It is important for her that these are things that the children can have an influence on. Furthermore, she points to the self-efficacy of the children:

> I think you always have to work in the area of the child's self-efficacy. I cannot explain to the child that driving a car is so bad, please tell mom to walk to the supermarket next time instead of driving the car. The child has no influence on this. It has an impact for example on the issue of waste separation. It is necessary to begin in the area of the child's self-efficacy. (Isabella)

To Isabella it is necessary to teach the children those things where they can really act themselves and have an influence.

Ann pointed to learning that accompanies the whole life:

> So that it is lifelong, that it is applicable to many areas, that it has to do with attitudes and your own personality. […] I see it more in the social context and in this regard, that I am aware of it, not just what it does to me, but how I can work with it in society and in the very big society or what I can cause. (Ann)

She said what the children learn in school should be relevant for the whole society and give them the tools they need for being part of this society. "That it [the child] is simply able to be responsible and to participate, not only in the small group, but in what is happening in the world" (Ann). In Ann's opinion children have to learn how to be responsible and how to participate. Later she talked about world peace as something that the children should know about "even if it is just a thought" (Ann), to her it would be very important that the children are sensitive to it. Another important skill she mentioned is problem solving "in any area" (Ann) and she argued that this is a skill that the children need for their whole life. In this aspect Ann is in contrast to Isabella and Susan, as she was more focused on what the children need for their future in their everyday life and not as much as what they need now as children.

Lucy also talked about the future, she said it is important to implement ESD in her teaching because it is about the future of the children and the future of the world and the society. In her opinion it is necessary to start introducing ESD to the children in primary school. "That it is just everyday life and normality for them to worry about these things." (Lucy), she said. Lucy also explained which issues are important to her which she referred to as "these little things in everyday life" (Lucy), such as how the children separate their waste, or avoid making waste, or how to use resources in a responsible way. A main emphasis is how to increase the children's consciousness for all these things. Lucy explained that the children should be able to "directly use" (Lucy) what they are taught at school regarding ESD so it is important to start with things that affect their everyday life and where the children can have an influence. Lucy hoped the children would take these "little things" (Lucy) home: "That you also see how you bring it home and that they bring more awareness to the parents. That would be the goal somehow" (Lucy).

Susan described it in a similar way. She stated that ESD is "an important part of life" (Susan) and should be about the "communication of a sustainable way of life" (Susan). Susan also referred to the "little things" (Susan) that can be influenced by the children, as Lucy did. She explained what the most important ESD issues are to her:

> So I think that most important or most interesting are the topics where the children themselves can contribute. So I think that is very important. Because if I say 'no more poverty' for example, that is a difficult topic to grasp, of course it is understandable, but you cannot do much about it yourself. If I now talk about sustainability in relation to food, the children can probably change something if they then say to the parents 'Mom, do not take a plastic bag or let us take a bag from home.' Or these little things where the children can really have an impact on it. These are the most important areas for me. The four I have already mentioned:

> waste, traffic, food and energy. Because I believe that these are also the areas where the children can do a lot themselves. (Susan)

Later Susan also referred to other issues that are important, but she always came back to these four topics because she repeated these are the areas where the children can do something themselves. Her emphasis is that the children are able to act.

Learning for life has different emphases according to the statements of the pre-service teachers in the interviews. On the one hand the pre-service teachers argued that it is important to teach the children things they can immediately use in their everyday life. In their opinion ESD should allow the children to connect the knowledge and skills they learn at school with their everyday life. They should be able to take these skills home and influence their families and friends, too. And on the other hand, the children should learn things they need for their whole life, like participation, responsibility, problem solving. The pre-service teachers mentioned this category more often than others; therefore, it can be concluded that learning for life is very central to them.

ESD is a Necessity and a Teaching Mission

When asked why ESD important, participants responded that they viewed it as both a mission and a duty to teach ESD. Lucy explained:

> I think it is a mission somehow, I just have to accomplish a task, when I release these children after these four years, I just want them to be reflected people who just have a bit of a clue about it and pass it on to their families, to their friends. As said, it should actually be deeply anchored in them. That's a high aspiration that I have, probably. (Lucy)

Isabella explained that she is not only interested in ESD, it is necessary to engage with it. In her opinion it is the right time to do so. She said:

> Because the time is right, because there is no more time to waste and because we are all affected. Actually, out of necessity, that is not because I like to deal with it, but because it is necessary and because you have to do something and because you just have to deal with it, that is not a voluntary thing now. So, I see it as an obligation for everyone to deal with it, to be interested in it and to pass it on. Yes. My teaching mission, so to speak. (Isabella)

Isabella connects her mission as she says with the circumstances, we are living in. Isabella argued that there is no choice, she does not engage with ESD just for fun, but because it is necessary.

Wish for more ESD Content during Teacher Education

The pre-service teachers stated that they wanted to have more ESD content during their teacher education. Susan explained that the seminars that deal with ESD are only voluntarily. She

wondered if mandatory seminars would give every pre-service teacher the chance to get in contact with ESD to arise their interest: “it would be nice if there were already seminars about it within the training for all students where their interest could be aroused.” (Susan)

Isabella and Lucy explained that they did not get in contact with ESD before they started the master program. Both having not heard about it before they felt it is such an important issue that it should have much more space within teacher education in their opinion.

5.2.3 Relation to own Life

Personal Interest is a Requirement

For Susan it was important to point out the personal interest as requirement for the engagement with ESD. She argued that she found the voluntary courses with ESD content because she was interested in ESD and wanted to find them. It was her personal interest that drove her to the courses. She said: “When you are really interested, then you find the respective seminars. Thus, I believe that for students who have no great interest in the topic themselves it will fall by the wayside during their teacher education” (Susan). Susan’s concern was that some pre-service teachers do not get exposed to ESD during their teacher education because they have no personal interest in it and therefore do not find the respective seminars. That is the reason why she would make it mandatory content within the teacher education, so that everyone has the chance to engage with ESD. But then still there is the risk that the pre-service teachers do not implement it in their teaching because the courses could not arouse their interest. Susan argued:

> And if it does not matter to you at all, then you won't do it anyway, more or less. But if you at least get the idea, maybe something will develop from it. And I believe that it is an important subject for teaching right now. (Susan)

Sustainability as a Personal Concern

A common argument for implementing ESD in their teaching was, that the pre-service teachers are concerned with sustainability in their personal life. They argued that they want to implement ESD because it is a personal concern for them too. Isabella said for example:

> In general, I also deal with sustainability in my personal life, so that is generally a big concern for me, and I also think that the topic is already relevant in primary school. Of course, everything has to be to a child-friendly extent, in a simplified form. (Isabella)

Later she said that she lives sustainably herself and therefore she also wants to teach the children to do so. Susan said nearly the same: “And it is a very important topic for me because I try myself to live sustainably. Thus, I want to pass that on.” (Susan). She wants to do that

because she thinks that many children do not learn that at home. Therefore, it is the task of the school to teach it.

Influences from the Family Environment

Another reason why ESD is important was mentioned by Lucy when she spoke about how her environment influenced her attitudes:

> So I believe that generally my nature, my upbringing has always gone in this direction. My mother, too, has always been living like this and being as environmentally conscious, grounded as possible. But it has been through the media, the activities in recent years, I believe that it has now only intensified and is being handled more consciously. (Lucy)

She mentioned especially her mother that may is seen as a role model here. Her upbringing and her environment influenced her attitudes, opinion and the way how she lives.

5.3 General Findings from Both Data Sources

While the survey offered predefined statements about ESD, in the interviews the pre-service teachers were able to elaborate on their views, opinions and attitudes freely. Both sets of data complemented each other, and the results can give a valuable insight into pre-service teachers attitudes towards ESD. The analysis of the survey and the analysis of the interviews dealt both mainly with the question: what do pre-service teachers at KPH think, know and feel about ESD. The results that have been described in detail above shall now be brought together. They are ordered in this way according to the analysis question.

5.3.1 Opinions about ESD

The majority of the pre-service teachers expressed that ESD is important and interesting to them in general, but that it is also important to include it the own teaching practice and in teacher education. There is even a strong wish for the inclusion of more ESD content during teacher education. The pre-service teachers realised that ESD courses during teacher education can stimulate the interest in it and therefore foster further engagement.

The pre-service teachers said that it is necessary for teachers to engage with ESD and that it is not a fad that will pass in time. In the interviews the pre-service teacher even declared ESD as teaching mission and a duty. They strongly believe that teachers have an important role in solving sustainability-oriented challenges through education. The role of the teacher is very central in ESD. The pre-service teachers experienced and observed themselves that it depends on the teacher if s/he implements ESD content in his/her teaching practice. A critical remark was made about the actual practice of ESD when it was mentioned that it is not always obvious

in primary school classrooms. Thus, the pre-service teachers have adapted positive opinions about ESD, but also some critical ones, like about the actual practice of ESD in schools and the implementation of ESD in teacher education which should be more content according to them.

Pre-service teachers think that ESD is important because it is lifelong learning that will accompany the students for a long time and that gives them practical tools, skills and knowledge, but also values that they need in their everyday life. They state that ESD is learning for the future and what the students learn will hopefully also affect others, like the family or even the whole society.

5.3.2 Knowledge about ESD

In the survey more than half of the participants stated that they are familiar with the concept of ESD, however 37,5% of the pre-service teachers stated they were not familiar with it. This was not further investigated in the survey, but in the interviews the pre-service teachers explained that they understood ESD dealt with the SDGs and ecological issues and that ESD is a broad and diverse issue.

5.3.3 Feelings towards ESD

The survey data shows that a large percentage of the pre-service teachers feel confident in their understanding of ESD and how they might communicate ESD to others. On the other hand, through the interviews it became clear that the pre-service teachers also feel overwhelmed and stressed when they think about ESD and about implementing ESD in their teaching. Thus, the feelings of efficacy towards ESD are not only positive. It needs further discussion to get a closer look at this phenomenon.

5.4 Summary

In this chapter the results from quantitative and qualitative were presented, first separately and in the end, they were brought together to describe the attitudes of the pre-service teachers at KPH towards ESD.

The pre-service teachers most agreed to the importance of the teachers' role regarding solving sustainability-oriented challenges through education. On the other hand, they critically remarked that it depends on the teacher if s/he is willing to implement ESD content in her/his teaching. Interestingly, the pre-service teachers stated that it is important to implement ESD in their own future teaching, most of them are also willing to do so. Another important point is according to the pre-service teachers the importance of the inclusion of ESD in pre-service

teacher education programs. The participants expressed a strong wish for more ESD content during teacher education.

The feelings towards ESD are not overall positive, with the pre-service teachers claiming that their knowledge of ESD is limited. However, it can be observed that the pre-service teachers at KPH have developed positive and critical opinions about ESD. In the following chapter these results will be discussed further.

6 Discussion

The above presented results point out that the attitudes and views of pre-service teachers at KPH towards ESD are positive but not in all areas. This is because the affective dimension is not only positive, as the pre-service teachers posed some concerns. This will be discussed in detail below. On the other hand, the pre-service teachers also developed some critical opinions about ESD in practice. First of all, the results will be discussed in relation to previous research, but also in relation to the theoretical framework.

6.1 Relation to Previous Research

The results of this research show similarities but also differences with results from previous studies.

An important finding is that pre-service teachers at KPH expressed that the inclusion of ESD content during teacher education is important to them and they desired to have more ESD content during teacher education. Other studies in this field also highlighted the urgent need for ESD courses within teacher education because of their positive effects for the pre-service teachers (e.g. Kyridis et al., 2005; Tomas et al., 2017). It is interesting that the pre-service teachers themselves expressed the wish for more ESD content in their education. However, most of them are convinced to implement ESD in their future teaching.

A remarkable point for discussion is the emotional dimension of the pre-service teachers' attitudes because it is the only dimension that is not only positive. In the interviews the participants mentioned the feelings of being overwhelmed and stressed and in the survey, it turned out that half of the pre-service teachers feel not confident in communicating ESD to others. Which aligns with the scale results where about 33% of the pre-service teachers at KPH are not confident about applying ESD in their teaching and about 30% of them feel unable to cope with imparting ESD. According to the findings of Spiropoulou et al. (2007) the pre-service teachers could create a feeling of helplessness if they lack knowledge about how to teach ESD. Taylor et al. (2006) found that pre-service teachers could be empowered by increased knowledge about didactics of ESD. Thus, according to this finding, including more ESD content in teacher education, especially didactics but also knowledge, could prevent pre-service teachers from feeling overwhelmed and stressed because it would equip them with relevant knowledge and tools.

Another argument for including ESD content in teacher education is, that Tomas et al. (2017) found that in pre-service teachers' view sustainable development was more relevant seen after partaking in an ESD course. One of the participants of the study in hand mentioned how important it is to give pre-service teachers the chance to engage with ESD and stimulate the interest. This can be done with the help of ESD courses or other events during teacher education. The question of interest versus relevance or necessity will be discussed below, as it is not the same and could be one of the crucial differences.

Another interesting observation is, that none of the pre-service teachers interviewed was critical about the concept of ESD itself - but they were critical about ESD in practice. It could be that have not yet engaged themselves with critical perspectives on ESD. They observed that ESD is not always obvious in primary schools. They expressed that they have not seen much ESD content in practice when they have been at schools. The other aspect on which the pre-service teachers expressed critical views was the wish for more ESD content during teacher education. In the pre-service teachers' opinion there should be more (obvious) ESD content in primary schools and in teacher education.

Not all pre-service teachers are familiar with ESD as the survey has shown. But those who are declared that ESD: is lifelong learning that can be practically applied in everyday life; equips the students for their future; deals with ecological issues and with the SDGs; is a broad and diverse concept. A similar understanding of ESD was also found by Evans et al. (2012). The pre-service teachers in their study stated that ESD is "(1) education that is continuous (long term); (2) education about ecological systems and environmental issues; (3) education that is active, hands-on, local and relevant; and (4) education for the future." (Evans et al., 2012, p. 5). Continuous education correlates with lifelong learning, active education correlates with practical skills, education for the future was also mentioned in the interviews in this research project and ESD deals with ecological issues belongs to the results of this research project too. As the study by Evans et al was conducted in 2012 the SDGs were not yet part of the study.

6.2 Personal Interest and Necessity

In the interviews the pre-service teachers declared sustainability was not only a matter for teaching, but was also a personal concern. Lucy explained how she was influenced by her family environment which had fostered a personal interest in sustainability. It was interesting to see that the pre-service teachers mentioned that the same issues were personally interesting as they thought important in school. For example, Ann mentioned that she is concerned with the social

dimension of sustainability in her personal life and also that this dimension is important to consider in school. Susan is interested in regional and seasonal food and stated this as an important issue to teach in school. This could be a hint that the personal interest in an issue influences what the teachers bring to the classroom or prefer to teach.

The pre-service teachers have reported two interesting phenomena in the interviews. The first was that they felt that ESD content depends on the teacher and the other related observation was that ESD is not always obvious in primary school classrooms. The pre-service teachers believed that it depends on the teacher if s/he brings ESD content to the classroom. They thought that if a teacher is interested in ESD s/he is more willing to implement it in his/her teaching. If a teacher has no interest, s/he is less likely willing to include ESD content. Nespor (1987) and Pajares (1992) support these observations and experiences with their theories about how the teachers' attitudes influence their behaviour. But again, it has to be said that it is not attitudes alone that influence the behaviour of a person. It is also the circumstances, policy, etc. that has to be considered.

The pre-service teachers had not seen much obvious ESD content in primary school classrooms. This could be, according to their observations, that the teachers in these schools were not interested in ESD. It could also be that the teachers simply have less or limited knowledge about ESD and therefore do not apply it in their teaching. Also, they may not have taken an ESD course or ever been required to teaching about ESD. This finding points once more to the importance of including ESD in teacher education or continuous education for teachers. Susan explained in the interview how important it is in her opinion to give all pre-service teachers the chance to engage with ESD, to have only one mandatory course for everyone. With this, every pre-service teacher would have heard even once during his/her teacher education about ESD. And if s/he is interested, s/he may takes more courses to learn more about it. But Susan emphasised that the personal interest of a person is a requirement to dig deeper into ESD. This personal interest has to be stimulated by giving chances to engage with ESD during teacher education.

The question arises if pre-service teachers have to develop personal interest in ESD or positive attitudes towards ESD to increase their will to implement it in their teaching or if they need to acknowledge ESD a necessity (or teaching mission as some of the pre-service teachers said). Both issues were reported in the results of this study. After taking an ESD course, pre-service teachers saw ESD as more relevant according to the findings of Tomas et al. (2017) where they do not report necessarily an increased interest or attitude, but increased understanding of

relevance. Thus, there could be two ways of stimulating the pre-service teachers' motivation to engage with ESD. One is the personal interest in ESD that is an intrinsic motivation. That means, the pre-service teachers engage with ESD because they like to do it for themselves. The other way is an extrinsic motivation for engagement with ESD, which could be seeing teaching ESD as an expected relevant necessary duty or a teaching mission. Often extrinsic motivation works with reward and punishment, however in the case of teaching ESD as responsibility it is more abstract. In an idealistic picture, the reward could be that the pupils are able to contribute to a better future for all, and punishment would be the contrary. This kind of reward or punishment does not directly affect the teachers in their work, but indirectly this could be a motivation and a recognisable contribution to the whole society.

This may be related to the pre-service teachers' strong level of agreement to the items that state the important role of teachers regarding solving sustainability-oriented challenges through education. If they think that the teacher has an important role this may be a suitable motivation for implementing ESD in the teaching practice.

The results of this study have shown that an argument of pre-service teachers could also be that motivation is a necessity to implement ESD in the teaching and it is not only a lack of knowledge about ESD and about didactics of ESD, the pre-service teachers need any point of contact with ESD that stimulates this motivation. Not everybody has to necessarily 'like' ESD as Isabella explained, when she was asked why it is important to her to apply ESD in her teaching:

> Actually, out of necessity, that is not because I like to deal with it, but because it is necessary and because you have to do something and because you just have to deal with it, that is not a voluntary thing now. (Isabella)

In this short section of the interview Isabella talked about ESD as her responsibility and as something that is necessary for teachers to do. Other pre-service teachers may have a similar view as Isabella.

A question that remains open is, why it is necessary to implement ESD in teaching – according to the pre-service teachers? This was not directly asked or explicitly discussed. It is possible that the answer relates to the pre-service teachers' opinions about and conceptions of ESD, in that it deals with sustainability-oriented challenges and lifelong learning. More simply put: ESD deals with the future, their own future, the future of the society and the future of the world and thus is something that would be necessary to engage with.

This sounds like the ‘almost religious expressions’ that Ideland and Malmberg (2015, p. 181) were critical about in relation to ESD and one must be careful to not get too deep into this ‘almost religious’ language and argumentation. What is the right balance then? A necessity in education or a teaching mission is usually stated in the respective curriculum. For example, authorities have decided some time ago that it is a necessity for primary school students to learn the basic arithmetic operations. UNESCO has suggested that ESD should be implemented in all educational systems. ESD could be treated in the same way as basic arithmetic operations, where people hardly question its’ necessity. That means, actions also need to be done from political side regarding the implementation of ESD in primary schools. If ESD was actually included in the curriculum as a required area of teaching and learning (a mission), responsibility and extrinsic motivation to implement ESD schools, would occur and it would be content just like teaching the basic arithmetic operations.

6.3 Dimensions of Attitudes

The results can also be discussed from the perspective of the three dimensions of attitudes that have been presented above. According to Rosenberg and Hovland (1960) attitudes consist of affective, behavioural and cognitive components or dimensions. The results can be sorted and discussed according to this classification.

The affective dimension deals with emotions towards an object, in this case towards ESD. The emotions of the pre-service teachers at KPH towards ESD are not only positive. Although most of them feel confident in their understanding and applying ESD in their teaching and in communicating ESD to others, some of them expressed that they felt overwhelmed and stressed when they think about ESD. It was discussed that this may correlates with a lack of knowledge about ESD and practical didactical tools. The pre-service teachers also stated that ESD is a broad and diverse issue, which may also play a role in the feelings of being overwhelmed and stressed. Because the pre-service teachers said they feel overwhelmed when they *think* about ESD and if they think that ESD is a very large concept, this can be overwhelming. More comprehensive knowledge about ESD could prevent such feelings as has been discussed above. Interestingly, despite these feelings most of the pre-service teachers are willing to implement ESD in their teaching. This could be because they see ESD as a necessity or teaching mission, and because they believe in the important role of the teacher. The pre-service teachers at KPH think that teachers must play an important role in solving sustainability-oriented challenges through education. It could be that regarding the implementation of ESD in the own teaching

practice this is much stronger than the feelings of being overwhelmed and stressed when thinking about ESD.

The behavioural dimension of attitudes deals with readiness, intention or tendency to act. This dimension appeared to be strong, as most of the pre-service teachers stated that they plan to implement ESD in their future teaching. All of them said that it is important to include it. Therefore, it can be argued that pre-service teachers at KPH have a strong intention to implement ESD in their future teaching, which is an important aspect to them.

The cognitive dimension deals with beliefs, opinions, judgments and knowledge about ESD. This dimension especially points out how the pre-service teachers at KPH constitute ESD. In their opinion ESD has to do with SDGs and ecological issues. But what is more interesting, ESD is learning for life. ESD deals with the future and with practical skills the students learn in school and apply in their everyday life. The pre-service teachers also stated that ESD is a necessity and an important 'teaching mission'. Most pre-service teachers agreed that it is necessary for teachers to engage with ESD. Beside the fact, that other studies about pre-service teachers' conceptions of ESD found similar results that the pre-service teachers see ESD as lifelong learning and learning for the future, the issue of lifelong learning can also be found in UNESCO's definition of what ESD is. One of the main characteristics of ESD is lifelong learning. Also, the transformative and holistic aspect belong to these main characteristics (UNESCO, 2017a). In the way the pre-service teachers described how ESD is learning for life they addressed these aspects in some cases. For example, one of the pre-service teachers mentioned in the interviews that the students should bring home to their families what they have learned at school and therefore influence others. The students shall be encouraged to act themselves, therefore they should learn in an action-oriented way what they need for their everyday life. The separation of waste was mentioned in the interviews as an example. That means, the beliefs and opinions of the pre-service teachers at KPH about ESD align with UNESCO's description of what ESD is.

UNESCO states that ESD

> allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future;
> empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations;
> is a holistic and transformational education that addresses learning content and outcomes, pedagogy and the learning environment;
> achieves its purpose by transforming social institutions so they can respond creatively to global sustainability challenges. (UNESCO, 2017b, p. 25)

If the statements of the pre-service teachers are compared to this definition, it gets obvious that economic issues were not mentioned by the pre-service teachers in the interviews, but these issues are not yet relevant in primary school. Also, the *just society* does not seem to be an issue for primary school, the pre-service teachers had their focus on ecological issues. Furthermore, the pre-service teachers were more concerned in their statements with learning content and outcomes (learning for life), than with pedagogy and learning environment. A remarkable point is also, that the pre-service teachers were much concerned with practical skills and issues that directly affect their students. The global dimension of ESD was not captured in their description. The focus of the study in hand was not about the pre-service teachers' conceptions of ESD, but their attitudes. On the other hand, a component of attitudes is the cognitive dimension, therefore, it is interesting to see the similarities and differences of pre-service teachers' conception of ESD with the definition of UNESCO.

As the pre-service teachers mentioned that students should learn practical skills at school (regarding sustainability-oriented challenges) that they could bring home to their families and friends and influence them with their new knowledge, critical aspects of ESD must be rocognised. Jickling (1994) argued that he does not want students to be educated *for* sustainable development, but rather *about* sustainable development. He posed the question, if education should influence the behaviour of the students. Jickling (1994) argued that students need knowledge, and also the chance to decide for themselves what they want to do. UNESCO has an emphasis on practical skills regarding ESD, but also the dimension that learners should be critical and participative. But the question of Jickling (1994) is still legitimate. Who decides if and how the behaviour of the students can be influenced through education? The pre-service teachers have argued that 'these little things' (as they have called it) that the students learn in school will accompany them their whole life, they are part of learning for life. And this is really central according to them and according to UNESCO policy.

In this regard it is also important to mention, that not all pre-service teachers at KPH are familiar with the concept of ESD. There is need to catch up.

6.4 Understanding the Results Considering the Contextual Circumstances

This study has been conducted during coronavirus-pandemic in spring 2020. In Austria from mid-March onwards restrictions on leaving the house for meeting with other people were in place along with several other regulations for the containment of the spreading of the virus.

That means all public discourse took place through (social) media and press conferences from the government. A big issue in public discussion was – amongst others - education. This situation posed a lot of questions and discussions which were not very prominent before. Some of these discussions were related to the field of education. For example, with the complete move to distance learning the question of equality for all students was posed. Not all students had the same conditions at home for distance learning, which is not only related to hardware like computers, but also to social factors like support from parents. An educational psychologist from the University of Vienna said in a press conference that the gap between different social groups is widening due to the situation of distance learning (Madner, 2020).

In contrast to the pandemic situation more than a year before the study was conducted, the protest movement "Fridays for Future" became popular in Austria. More and more young people wanted to draw the attention to climate change, loss of biodiversity and other sustainability-oriented challenges. At some points in time there was a lot of attention from the mainstream media on these protests. A main critical discussion point was if students should go to school on Fridays or protest on the street. Sustainability issues were present in public discourse and also discussed. This development suddenly also stopped due to coronavirus-pandemic as meetings were prohibited. Climate change and related issues took a backseat in this time, as well as other usually very prominent issues like migration.

That means, the results must be understood in this context. The pre-service teachers that took part in the study were concerned with this context. Maybe they were quite active in the "Fridays for Future"-movement and engaged with sustainability-issues, maybe they were concerned about the discussions of equality in education. The effects of the coronavirus-pandemic on the educational system – be it the public discussions about education and equality, or the fact that all education was done through distance learning – influenced the pre-service teachers in any way, some more directly and others more indirectly. Research found that attitudes do not change quickly, but they can be influenced by new experiences or learning processes, which sometimes even lead to changes of attitudes (Bornewasser et al., 1979). Therefore, the attitudes of the participants of the study were influenced by these contextual circumstances where the pandemic and related issues had priority.

6.5 Summary

The pre-service teachers have expressed affective, behavioural and cognitive attitudes towards ESD, which are in general positive, but also critical in some points. The strongest agreement

amongst pre-service teachers was that teachers can play an important role regarding sustainability-oriented challenges through education; that it is important to include ESD in pre-service teacher education programs and that it is important to include ESD in their own future teaching practice. Yet a number of them also felt stressed and overwhelmed when they think of applying ESD in their own teaching. The pre-service teachers would like to have more ESD content during teacher education and are willing to implement ESD in their future teaching. They observed that ESD content is not always obvious in primary school classrooms, and it depended on the teacher if s/he implements ESD content in his/her teaching. Thus, the teacher has a central role regarding ESD. Pre-service teachers at KPH also believe that teachers can play an important role regarding solving sustainability-oriented challenges through education.

However, these findings may not be true for all pre-service teachers at KPH generally, because only a small group of them participated in the research project and stated their opinions. Therefore, this research only presents the opinions of a small sample. Further research in this area is suggested but also in related areas. This will be elaborated upon below.

The results were discussed from different perspectives in this chapter. It was discussed how they relate and contribute to previous research in the field. Similarities and differences with previous studies were presented and discussed. Also, remarkable findings were discussed. The elaboration of the attitudes was put into the theoretical frame, by using the model of Rosenberg and Hovland (1960). It was also discussed how the results help understanding the stated research gap and how they contribute to the understanding of the topic. It is important to note, that this research project was conducted during coronavirus-pandemic in spring 2020, which means that the results have to be seen in the light of this contextual circumstances.

7 Conclusions and Recommendations

7.1 Conclusions

The aim of this research project was to find out which attitudes and perspectives towards ESD future teachers bring to the classroom. This aim was achieved by finding out about the relative positive attitudes of the pre-service teachers and their strong opinions and views about ESD. It is interesting to see that they are very positive about ESD in classroom practice, because they think it is important and, more importantly, because they are willing to act and bring ESD into their own teaching practice.

The research questions of this project were:

- What attitudes, knowledge and feelings do pre-service teachers at a large Austrian Teacher Education Institution have towards Education for Sustainable Development (ESD)?
- How do pre-service teachers see their future role as teachers regarding ESD and how do they view the ESD content they receive in teacher education?

These questions will be answered in this chapter.

What attitudes, knowledge and feelings do pre-service teachers at a large Austrian Teacher Education Institution have towards Education for Sustainable development?

Pre-service teachers at KPH strongly believe that the teacher has an important role to play in ESD and that sustainability-oriented challenges can be solved through education. They also believed that it depended on the individual teachers' interest in the area if ESD content was included in the teaching practice. Interestingly, some also talked about including ESD in teaching as a responsibility, necessity, duty or 'teaching mission'.

Thus, I conclude that it takes more than positive attitudes towards ESD to actually include ESD content in classroom practice. However, it should not only depend on the attitude of a teacher if there is ESD content or not in the classroom practice. Apart from knowledge about ESD – a basis needs to be established for the implementation of ESD in primary school. This could be in a curriculum and mandatory content in teacher education. If ESD is stated in primary school curriculum it would be mandatory for teachers to implement it in their teaching and it would really be a teaching mission for all teachers. Some pre-service teachers stated that ESD is a necessity, and in the survey most of them also agreed that it is necessary for teachers to engage with ESD, but such widespread uptake is yet to be seen.

How do pre-service teachers see their future role as teachers regarding ESD and how do they view the ESD content they receive in teacher education?

The pre-service teachers at KPH do not only think that it is highly important to implement ESD in the own teaching practice, but also, and perhaps because of this that it is implemented in teacher education. At the moment there are two voluntarily courses that deal with ESD content at KPH and *no* mandatory engagement with ESD for the pre-service teachers. Thus, I conclude that there should be at least one mandatory course about ESD for the pre-service teachers at KPH (respectively in all teacher education institutions). It became obvious that not all pre-service teachers are familiar with the concept of ESD and those who were could not articulate the whole concept. Furthermore, they confessed to feeling overwhelmed and stressed when thinking about ESD because it is such a broad concept in their opinion. There is a lack of knowledge about the concept of ESD, but also about didactics. Thus, more ESD content during teacher education, that included didactical perspectives of ESD, could prevent these feelings, as previous research has shown (Taylor et al., 2006). The findings of this study follow previous studies' advice for the urgent need of implementing ESD content in teacher education.

Regarding the concept of ESD the results of the research project also show that the pre-service teachers were not critical about the concept of ESD itself. This could be because of their lack of knowledge about the concept. Thus, I conclude that pre-service teachers do not only need knowledge about ESD, but also engage with critical perspectives on ESD. Learning about ESD in teacher education should include both – understanding the concept and its didactics, but also learning about critical perspectives. This gives the pre-service teachers the chance to engage with ESD from different perspectives and to gain deeper understanding of the concept. Then they can make informed statements about ESD and informed choices for their own practice. It gives the pre-service teachers also the possibility to reflect critically with the own teaching practice.

7.2 Filling the Research Gap

The results contribute to the research field because they considered a specific context, which is pre-service teachers at KPH. Furthermore, they add to the field of existing similar studies the Austrian perspective. The results give insight into pre-service teachers' attitudes towards KPH, what they think, feel and know about ESD. They especially consider the context of teacher education at KPH.

This research project does not fill the whole research gap, which is the Austrian context in ESD research. But it can mark a starting point. It can also mark a starting point for further engagement with ESD at KPH. The results can or should open a discussion about ESD in primary schools. Pre-service teachers think that implementing ESD is important, but they definitely need more support and guidance in form of courses and seminars during teacher education. Thus, the findings should be relevant for KPH as they reflect the perspective of the pre-service teachers that are studying there. During the discussion it also became clear that there are many further ideas and questions regarding ESD in teacher education that could be investigated, like the question of motivation for example.

In summary, it can be stated, that the results serve the aim of the research project, which was to investigate the attitudes of pre-service teachers at KPH towards ESD. And the results add an Austrian perspective to the existing related research projects in this field.

7.3 Methodological Limitations of the Study

The study was conducted on a small sample size. This was due to the contextual circumstances that have been discussed above. Originally it was planned to have more participants for the questionnaire and the interviews. The online survey was left open for as long as possibleto gather more responses. However, because the sample size was smaller than hoped, analyses remained on the item-level, and only descriptive analyses were conducted. This is a strong limitation to the quantitative part of the study, but I believe that it nevertheless contributed greatly to answering the research questions.

The participants from the interviews have also participated in the online survey. They asked for the interview questions in advance to be prepared for the interview. Therefore, they took the survey for preparation. But this means, their opinion appears in both data sources.

Finally, the scale instructions did not include a definition of ESD. That means, there was no common agreement or understanding of the concept among the participants. Future research would include a short definition as a starting point.

7.4 Suggestions for Further Research

This research is a first step to gain insight into ESD attitudes, opinions and practice in Austria, specifically at KPH. But this research project made clear that further steps in research and practice are necessary.

In this study it was not possible to cover all perspectives on ESD at KPH. Only the perspective of the pre-service teachers was investigated. Thus, further research may be done amongst teachers of KPH, for example to investigate their attitudes towards ESD. This could be an interesting complementary approach to the understanding of ESD at KPH. Furthermore, it is possible to analyse KPH-policy, curricula etc. to find out how ESD is anchored in it. This would help grasping the full picture of ESD at this institution.

Another interesting research project could be to investigate how other University Colleges of Teacher Education in Austria deal with ESD. What courses do they offer? How important is it to the teachers and pre-service teachers there? How is ESD anchored in their policy, curricula etc? In such a project that surveys the individual approaches of the respective University Colleges of Teacher Education towards ESD, these approaches can be compared and see what the institutions can learn from each other or how they can work on a common strategy concerning ESD in teacher education programs.

7.5 Recommendations for ESD Practice at KPH

Beside the suggestions for further research, recommendations for ESD practice at KPH can be given based on the results and conclusions. The pre-service teachers stated a strong wish for more ESD content during teacher education. This can be picked up on for further work on the curriculum for example. The pre-service teachers are willing to implement ESD in their future teaching because they think it is interesting and they see it as necessity and teaching mission. They need space for engagement with it during their education to increase the knowledge about ESD and to gain confidence in handling the implementation of ESD in the future classroom practice, as well as gain confidence in communication and imparting ESD to others.

But they have also observed that ESD is not always obvious in primary schools. Thus, it can also be recommended to develop ESD courses within continuing education for teachers. This would give the teachers the chance to engage with ESD too and when pre-service teachers do their practical teaching studies in their schools, they – hopefully – actually see ESD in primary school practice. Thus, ESD courses are not only a concern for pre-service teachers within teacher education but also for in-service teachers. Luckily, KPH can offer courses for both.

7.6 Closing Words

15 years ago, UNESCO started the Decade of ESD, which marks a starting point for global engagement with ESD. The aim was to implement ESD in all educational systems around the

globe. The Decade of ESD was followed by the Global Action Programme, which was followed by the newly introduced program ESD for 2030. The programs should strengthen ESD in the national educational systems.

Despite that development ESD is not yet anchored in primary school curriculum in Austria. And it is not an essential element in teacher education programs for primary school teachers, at least not in every University College of Teacher Education. Less research was done regarding ESD im primary schools in Austria so far.

Despite these circumstances, pre-service teachers at KPH are positive about ESD and willing to implement it in their own teaching. For this, they need support in form of mandatory ESD courses during teacher education, but also training for in-service teachers regarding ESD.

Why is it necessary for (pre-service) teachers to engage with ESD? Teachers can shape the future by teaching students essential skills they need for their life. These skills are not only reading, writing and calculating, but also critical thinking, participation or why it is necessary to separate your waste. Education influences the future of the respective children, but in further consequence the future of the society and the world. According to the pre-service teachers at KPH teachers make a major contribution to solving sustainability-oriented challenges through education. Thus, it should not only depend on their attitudes if they are willing to implement ESD in their teaching practice. ESD should be anchored in the respective policies.

This will hopefully happen, when the new curriculum for primary school will be established. The future of ESD in Austria seems to be a good one, because pre-service teachers are so positive about it. More support in teacher education and teaching practice is definitely needed.

At the end of this thesis an outlook can be given on the upcoming academic year 2020/21 at KPH Wien/Krems. According to information by vice-rector Thomas Krobath this year shall have an emphasis on the SDGs. One goal is, that everybody at KPH – students, teachers, staff – knows the SDGs and their interrelatedness. Also, all actions shall be oriented towards the SDGs. Thus, there will be instances for pre-service teachers at KPH to get in contact with the SDGs and in that relation hopefully learn about ESD too.

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Appendices

Appendix 1: Survey Items

Dear students,

In the research project "Pre-service teachers' attitudes towards education for sustainable development", the attitudes of pre-service teachers at KPH towards education for sustainable development are being researched.

A few statements are presented below, and you should decide how much you agree with these statements. It is about your personal opinion. Participation in the survey is of course voluntary and anonymous. The results of the project will be published in a master thesis at Gothenburg University and at KPH. Thank you for your help.

In addition to this online questionnaire, participants are also sought for short interviews on the topic (presumably via Skype, with a maximum duration of 30 minutes). I am happy if you are interested and you can contact me directly by e-mail: jennifer.jakob@kphvie.ac.at

Q1.1 Age:

Q1.2 Gender: male / female / diverse

Q1.3 Study: Teacher training for primary school / upgrade / other

Q1.4 Level: Bachelor / Master

Q1.5 Term: 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8

Q1.6 Special focus: Religious Education / Inclusive Education / Early Childhood Education / School as Self-Developing Organisation / Media Education / Language Education / Mathematics and Science / Humans in Society, Culture, Time and Space / Arts, Crafts and Design / Music and Sports / not yet decided, none

Q2 How much do you agree with the statements below?

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Q2.1 I am familiar with education for sustainable development				
Q2.2 Education for sustainable development is important to me				
Q2.3 Education for sustainable development is interesting to me				
Q2.4 I feel confident in applying education for sustainable development in my teaching				

Q2.5 I feel confident in communicating education for sustainable development to others				
Q2.6 I am unable to cope with understanding what education for sustainable development is				
Q2.7 I am unable to cope with imparting education for sustainable development				
Q2.8 It is not necessary for teachers to engage with education for sustainable development				
Q2.9 Education for sustainable development is a fad that will pass in time				
Q2.10 Teachers can play an important role in solving sustainability-oriented challenges through education				
Q2.11 It is important to include education for sustainable development in my future classroom practice				
Q2.12 I will implement education for sustainable development in my future teaching.				
Q2.13 It is important to include education for sustainable development in pre-service teacher education programs				
Q2.14 There should be more education for sustainable development content during teacher education				
Q2.15 The inclusion of education for sustainable development in my pre-service teacher education program will directly benefit my ability to teach students about sustainability				

Appendix 2: Interview-Guide for the Qualitative Interviews

1. What do you think of when you think about education for sustainable development?

2. In general, are you interested in ESD-issues? Why / Why not?

    If yes: What are the main aspects of ESD you are interested in? Why

3. Have you learned or heard about ESD in your study or in your practical pedagogical studies so far?

    If yes: Do you think it is interesting / not interesting / annoying / don't care? Why?

    Is ESD important or not important to you? Why?

    Which feelings do you associate with ESD? Why?

4. Imagine your future class. Dou you think you will implement ESD in your future teaching? Why / Why not?

    Is it important or not important for you to do so? Why?

    Which feelings do you associate with ESD in your future classroom? Why?

    What would be the main ESD issues you would like to implement? Why?

5. Is there anything else regarding ESD you want to tell me?

Appendix 3: Results of Descriptive Analysis on the Item Level

item	N	mean	standard deviation
Teachers can play an important role in solving sustainability-oriented challenges through education	40	3,58	0,501
It is important to include ESD in pre-service teacher education programs	40	3,55	0,504
It is important to include ESD in my future classroom practice	40	3,53	0,506
ESD is important to me	40	3,48	0,554
There should be more ESD content during teacher education	40	3,40	0,672
ESD is interesting to me	40	3,35	0,533
I will implement ESD in my future teaching	40	3,35	0,580
The inclusion of ESD in my pre-service teacher education program will directly benefit my ability to teach students about sustainability	40	3,30	0,648
I feel confident in applying ESD in my teaching	40	2,80	0,911
I am familiar with ESD	40	2,67	0,730
I feel confident in communicating ESD to others	40	2,53	0,847
I am unable to cope with imparting ESD	40	2,20	0,791
I am unable to cope with understanding what ESD is	40	1,98	0,891
ESD is a fad that will pass in time	40	1,45	0,639
It is not necessary for teachers to engage with ESD	39	1,38	0,782

Appendix 4: Distribution of the Frequency of the Categories Found in the Interviews

category	number of codes	% of all codes	number of persons	% of all persons
ESD is learning for life	18	31,58	4	100
Sustainability as a personal concern	6	10,53	3	75
ESD content depends on the teacher	6	10,53	3	75
Feeling overwhelmed and stressed	5	8,77	3	75
Wish for more ESD content during teacher education	4	7,02	3	75
ESD is not always obvious in primary school classrooms	4	7,02	3	75
ESD is a necessity and a teaching mission	3	5,26	2	50
ESD deals with ecological issues	3	5,26	2	50
ESD is diverse and broad	3	5,26	2	50
Personal interest is a requirement	3	5,26	1	25
ESD deals with the SDGs	1	1,75	1	25
Influences from the family environment	1	1,75	1	25