
BACHELOR

EDUCATION FOR SUSTAINABILITY

TO WHAT EXTENT ARE INTERNATIONAL PRIMARY SCHOOL TEACHERS IN THE IB
CURRICULUM QUALIFIED TO TEACH ENVIRONMENTAL ISSUES?

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ABSTRACT

This study aimed to investigate to what extent are international primary teachers qualified to teach about sustainability among students. Based on a review of the literature data has been gathered from primary and secondary sources that included interviews, an online survey, and a document analysis. The research has been conducted at an XY IB-School in central Europe that has been accredited within the IB-system for over 15 years. The interviews and online survey have been conducted to evaluate participants perceptions and understanding of sustainability in the context of an IB-Curricula environment. The total participants included 25 primary school teachers from grade one up to grade five including the leaders and principals as well as EAL and SEN teachers.

The evaluations and the collected data show that international primary school teachers struggle to implement sustainable aspects within their six units of inquiry. Moreover, the 17 Sustainable Developmental Goals (SDG's) are not mentioned within the IB-Curricula and are therefore not commonly shared among the international primary school teachers. The outcomes highlight that only a part of the participants know about SDG's and the possible resources for educating about environmental issues. Through the additional answers of the interviews, it was especially clear to analyse the possible needs of the participants and the school itself. With the help of this research example, the XY IB-School in central Europe was able to identify and adapt their learning process by sharing and using teaching resources about sustainability.

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1. RATIONAL

1.1 INTRODUCTION

Our world is changing rapidly under an enormous stress level for more than 60 years! (Nolet, 2016; Taylor, Quinn, & Eames, 2015). It is time to make a change as everything that we do will shape the future and our children. Our children are confronted to grow up in an environment that we created and at the same time, they will influence the ecosystem as much as we did (Taylor, et al., 2015). Therefore, it is crucial to generate worldwide awareness of how we could save the planet to make it worth living for many years again!

The goal should be focusing not only on the current circumstances and problems but more likely on what will happen over the next years. In this case, we must educate our global citizens by making them aware of their influences on our world. A possible start would be to focus on our next generation by educating about sustainability in schools. Our children grow up in this world and need to know how and why they should be aware of environmentalism (Nolet, 2016). In primary schools', students develop a foundation of knowledge and learn about the principles and values of living. Hence, it would be great to use education as a powerful learning tool to create worldwide awareness about sustainability and its interconnected problems (Nolet, 2016; Taylor, et al., 2015; Bürgener & Barth, 2017).

Implementing education for sustainable development (ESD) in primary schools will be helpful in order to equip our young learners with critical thinking skills to be aware of the sustainable development goals (United Nations, 2015). Today and in the future, students' deal with complex challenges that are correlated to the principles of sustainable developments. Those interrelations between the economic, environmental, social and cultural perspectives will determine their and our future (Wolff, Sjöblom, Hofman-Bergholm, & Palmberg, 2017). Consequently, primary school teachers play a central role when it comes to educating about the intricate topic: sustainability.

The central IB-Curricula interferes with inquiry-based learning approaches that help teachers and students to interact actively within local and global contexts (Iborganization, 2020). The main focus for each inquiry is to ask challenging questions and to think critically in order to develop an awareness that can be applied to other important circumstances outside of school such as environmentalism. In order to maintain those goals, teachers need foundational support and training programs to accomplish the challenging task of implementing ESD efficiently (Bürgener & Barth, 2017). Consequently, we need to analyse the current possibilities to establish and adjust the support tools for teachers.

1.2 OBJECTIVES

This research aims to have an empirical investigation on a necessary topic: Education for Sustainability (EfS). Since our planet has taken resultant damage from our own habitats, we need to establish a way of compromising the damages in the long run. The research will analyse how EfS is integrated into the field of primary education by investigating teachers' perceptions of environmentalism and its principles of economic, environmental, social pillars. Moreover, the research will explore whether the principles of EfS are taught within the right balance and if the principles are integrated across the school system. Furthermore, the outcomes of this research should lead to concrete methods on how to provide support for international primary school teachers with appropriate teaching tools with the help of the existing IB-Curricula. It is essential to find possible solutions and connections within the IB-Curricula to have a foundational framework to establish powerful learning among the students so that they can preserve their future (Taylor, et al., 2015; Carbach & Fischer, 2017).

1.3 MOTIVATION

The aim of this research is focused on gaining more insights into international primary teachers' perspectives on teaching sustainability. As a future primary school teacher, I would like to know how international primary teachers are supported and educated about the intense topic of environmentalism.

Therefore, my motivation focuses on the fact, that education for sustainability is a major topic in our global world. Everyone is certain about the current problems but the act of making a change is missing. In concern of this reason, I am aiming for more awareness through education as students will shape our future and next generations. This research will focus on the IB-Curricula as the PYP-Framework includes inquiry-based learning and teaching approaches that can be related to environmentalism (Iborganization, 2020). Moreover, I am curious to evaluate the International Baccalaureate framework for its connections with EfS. Hence, the research will take place at an XY IB-School in central Europe.

Moreover, I have realized that EfS is mentioned in a worldwide context as the United Nations published the developmental goals called *Agenda 2030* (United Nations, 2015). However, recent research shows that the transition from the theory of the paper into real-world action is difficult and requires a lot of time and effort (Nolet, 2016). Therefore, it is important to support our school community by finding out why and how EfS can be implemented in an overall context.

1.4 RESEARCH QUESTION

Current research expresses the importance of integrating and implementing ESD in schools as education represents the symbol and philosophy of creating a critical awareness among different contexts (Buckler & Creech, 2014; Taylor, et al., 2015; Nolet, 2016; Cook, 2019; Sinakou, Donche, Pauw, & Petegem, 2019). Since humans cause the harm and are responsible for the resultant damages on our planet, it is more than necessary to research the current possibilities of how international primary school teachers are facilitated by the school system to address ESD. Therefore, the research question of this thesis is stated as follows:

To what extent are international primary school teachers in the IB curriculum qualified to teach environmental issues?

In addition, three sub-questions will also be investigated. Those will be further explained in the following statements. The sub-questions will be analysed and discussed throughout the research thesis.

SUB-QUESTION 1:

- *Which teaching approaches are suitable for EfS?*

The main focus of this research sub-question is to find suitable teaching approaches that can be applied among international primary schools to educate students about sustainability. Therefore, existing studies, books and documents within Europe will be analysed to find a possible combination or solution of teaching approaches for EfS.

SUB-QUESTION 2:

- *What sort of competencies need to be required for teachers to implement EfS successfully?*

Furthermore, primary school teacher's competencies will be evaluated by analysing current studies about the needed requirements of teaching about sustainability in primary schools. Additionally, recent outcomes of the studies will be compared with the answers of the survey and the interviews. Those will take place at the XY IB-School among the primary school teachers, leaders, and principals as well as the EAL and SEN teachers.

SUB-QUESTION 3:

- *How well are IB-Curriculum primary school teachers equipped to teach about sustainability?*

This question will be answered by the end of this research after the outcomes of the online survey and the theoretical research scheme have been analysed. The aim is to find out how EfS is maintained at an IB-School by evaluating existing research and documents from the IB-Curricula and the current circumstances at the XY primary school in central Europe with help of the survey and interviews.

1.5 KEY-TERMS

TOPIC 1: INTERNATIONAL PRIMARY TEACHERS

International primary teachers are trained to educate around the world at international primary schools. They are connected with other educators to gather and share knowledge, skills and experiences to provide the best learning opportunities for their students.

TOPIC 2: IB-CURRICULUM

The IB-Curriculum aims to build a better world by educating students to be internationally minded within the ever-changing world. They strive for engaged students that take actions within their communities and beyond to make the world better (Iborganization, 2020).

TOPIC 3: TEACHING APPROACHES

Teaching approaches are designed for teachers to educate successfully about specific contents and contexts. Approaches can be different in their success as there are multiple ways of educating effectively. However, the purpose of teaching approaches is to develop and support teacher's knowledge, skills and teaching styles to create powerful learning environments for students (Sinakou, et al., 2019).

1.6 SIGNIFICANCE

This research is designed to analyse how international primary school teachers are supported by the IB-Curriculum to successfully teach the three sustainable dimensions: economic, social and environmental. Furthermore, the research will investigate what abilities and teaching methodologies are required to teach the three sustainable dimensions effectively to primary students (Boeve-de Pauw, et al. 2015; UNECO, 2012). Taylor, et al., (2015) and Nolet (2016) especially emphasize that education could be the key to address environmental issues by choosing powerful and appropriate teaching approaches. Due to this reason, official documents of the IB-Curriculum will be analysed to evaluate the existing connections between the inquiry-based contexts and the dimensions of sustainability (Iborganization, 2020; International Baccalaureate Organization, 2014). Moreover, the official documents and the interconnected survey will provide a general overview of how international primary school teachers are maintained through the school system to advise suitable methodologies and skills for EfS (Ortega & Taboada, 2018).

The outcome and results of the research will arise from an XY IB-School in central Europe. One of the main focuses is to elaborate on the existing IB-Curricula documents for sustainable features (International Baccalaureate Organization, 2014). In addition to that, the study will use an online survey and interviews to analyse teacher's comprehension as well as the encouragement of the school community when it comes to educating about environmental issues. Consequently, the results of this research are not only beneficial for the XY IB-School in central Europe as those could also be considered across other IB-Schools (Ortega & Taboada, 2018). The results will advise suggestions and will highlight the advantages of implementing EfS across the curricula and some general possibilities of how to develop a critical awareness about sustainability among the IB-School community (UNESCO, 2012).

2. LITERATURE REVIEW

2.1 SUSTAINABLE DEVELOPMENT IN THE SCHOOL- (IB) CURRICULA

Certainly, there is a growing interest in finding possible and suitable methodologies for schools to implement EfS accordingly and sufficiently into the existing school standards (Wolff, et al., 2017). In order to support this interest, schools need to know how they should implement EfS effectively into their school curricula. Furthermore, it is crucial for schools to understand the concept behind EfS in order to realize the importance of creating and sharing sustainable consciousness among the school community (Boeve-de Pauw, et al., 2015). Furthermore, Nolet (2016) emphasizes that education could be the key feature as it is the only possible way to reach fundamental awareness among our future generations. Therefore, we need passionate educators and school communities who are willing to change the current school system by implementing EfS across the curricula (Carbach & Fischer, 2017; Nolet, 2016; Taylor, et al., 2015; UNESCO, 2014). Henceforth, the school community requires a professional learning framework in order to empower our children '[...] to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity.' (UNESCO, 2014, p.12).

By choosing EfS as a key feature to change the world into a better world we automatically address a lifelong learning environment that requires professional teachers and high quality of education to develop a sustainable future. Moreover, Taylor et al. (2015) highlights the importance of providing and indicating meaningful approaches for our students. Those approaches should have multiple links to different contexts to reach global perspectives and to encourage sustainable consciousness (Boeve-de Pauw, et al., 2015). Nonetheless, those approaches are not automatically included in the existing curricula. Recent research shows that educating about sustainability is mainly considered as an additional class or as an activity that only takes place for a certain time period (Wolff, et al., 2017).

However, implementing EfS into children's world means more than just a quick experience. In order to reach full awareness of environmentalism, students need to actively explore what it means to live sustainably. Therefore, sustainability must be taught across the curriculum to become a matter of the curricula and school system itself (Taylor, et al., 2015; Nolet, 2016). According to Ortega & Taboada (2018), the IB-Curricula represents a possible option for implementing EfS because of the nature of creating an encouraging meaning-making among the students. Furthermore, the IB framework supports students' critical thinking by working with realistic and real-life inquiry-based approaches. The PYP framework focuses on six different themes, those are taught across the curricula to ensure a high quality of teaching as well as to '[...] develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.' (International Baccalaureate Organization, 2014, p. vii). By showing and living for sustainability in the school community, students will realize how powerful knowledge can be as it encompasses multiple aspects such as values, attitudes, expectations and objectives (Wolff, et al., 2017; Swiniarski & Breitborde, 2000). Consequently, the research about the existing curricula leads to the outcome that schools need effective teaching frameworks in order to reinforce the significance of environmental issues.

3. THEORETICAL FRAMEWORK

3.1 TEACHING APPROACHES

The application of ESD in primary schools will depend particularly on our teachers' pedagogical competence and the commitment of how to encompass EfS productively in class and the given curricula (Bürgener & Barth, 2017). As Nolet (2016) states, the right combination of teaching methodologies makes the difference when it comes to EfS. Teachers and the students need to find the right balance of combining the '[...] content knowledge as well as the pedagogical content knowledge [...]' with each other (Bürgener & Barth, 2017, p.823). However, Boeve-de Pauw, et al. (2015), as well as Borg, Gericke, Höglund, & Bergman (2013), found out that schools tend to not combine different teaching approaches due to the fact that they are unsure which teaching approaches are suitable for EfS. This highlights the crucial need for sharing a suitable framework for teachers to implement EfS successfully.

In addition, the ESD literature highlights three essential features that should be combined and implemented across the school system in order to achieve and develop active participation in environmental activities and the ability to handle complex and reliable sustainable issues (Wolff, et al., 2017). The three teaching features are characterized by holism and pluralism and an action-orientated approach. Those three features are intricately intertwined but necessary to develop the right skills for being sustainable (Sinakou, et al., 2019; Rudsberg & Öhman, 2010). Referring to Bürgener & Barth (2017), it is essential for teachers to apply all three teaching approaches to create positive learning environments that empower students to develop and acquire the necessary competencies for ESD. The holistic perspective of sustainable development (SD) focuses on all the sustainable dimensions including economic, social and environmental and leads to a holistic overview of interconnected contents (Sinakou, et al., 2019). The pluralistic perspective strives for gaining and applying multiple viewpoints and values when dealing with environmental issues at school and outside of school (Boeve-de Pauw, et al., 2015). This does not mean that one approach is better than the other one, but rather the fact that students need a holistic outline of ESD as well as the skills of the pluralistic aspects to compare and generalise their meaning-making (Rudsberg & Öhman, 2010).

However, there is always the challenge of combining theoretical knowledge with practical skills when it comes to EfS (Bürgener & Barth, 2017). Regarding the EfS literature, it is necessary to implement a third methodology called the action-orientated approach to foster the action competence of the students (Nolet, 2016). Likewise, early constructivists such as Vygotsky and Piaget emphasize the fact that acquiring new knowledge is based on action-orientated approaches that are dynamically formed through social constructions. Certainly, this underlines the importance of combining varied learning approaches as it helps students '[...] to construct new or modified views of the world.' (Taylor et al., 2015, p.36). Similarly, Swiniarski & Breitborde (2000) as well as Sinakou, et al., (2019), state that if students experience an intense collaboration between a holistic, pluralistic and action-orientated approach they will automatically develop the right balance of acknowledging the sustainable dimensions in and outside of school by evaluating the validity and significance. However, we should remember that it is not our children's responsibility to rescue the planet, it should be the aiming goal for everyone as we all take advantage of our earth (Taylor, et al., 2015; Wolff, et al., 2017).

3.2 TEACHERS COMPETENCE

In order, to empower students with the right balance of teaching approaches, we need to ensure a high quality of teaching to assure a sustainable way of life for all generations. However, in the field of teachers' competence and specifically the part about enhancing sustainability in school seems critical (Sinakou, et al., 2019; Nolet, 2016). Researchers found that teachers do not have a high qualification and comprehension about how to educate students about sustainability and the interconnected dimensions: economic, social and environmental (Buckler & Creech, 2014; Taylor, et al., 2015; Nolet, 2016; Wolff, et al., 2017; Cook, 2019). The lack of knowledge and the interrelated proficiency of EfS could be related to the fact that most teachers did not receive any theoretical knowledge about sustainability during their education (Wolff, et al., 2017). Consequently, most teachers have no confidence and self-esteem to educate effectively about sustainability in class (Carbach & Fischer, 2017).

Additionally, the final report of the United Nations World Decade on ESD highlights the fact that most schools merely implement ESD within the curricula scheme. Henceforth, sustainability is not implemented across different subjects and content (Boeve-de Pauw, Gericke, Olsson, & Berglund, 2015). It is mostly the teacher's responsibility to implement and adjust the learning contexts and objectives when it comes to educating about sustainability (Wolff, et al., 2017). It depends on the initiative from engaged teachers who are willing to acquire knowledge about possible concepts of how to implement EfS in class. This view of EfS must change as EfS should not be seen as a pilot programme at international primary schools, it should be seen as an initiative to sustain the planet (Wolff, et al., 2017; Nolet, 2016). Therefore, it is fundamental to support and engage our school community to deeply integrate EfS at their schools by redesigning their educational concept and objectives to establish global awareness. To achieve this global aim, teachers and students need well-elaborated teaching approaches and teaching resources to develop an ' [...] awareness of ESD as a future-orientated educational concept that prepares learners for the challenges of 21st-century challenges schools to account for the ways and the extent to which they actually engage with sustainability issues.' (Carbach & Fischer, 2017, p. 70).

The United Nations Economic Commission for Europe (2012) particularly created a competency model called ECE, that aims to inspire all teachers around the world to enhance the process of learning and adjustment in the field of ESD. The four core areas of the ECE competence model are called: *Learning to know*, *Learning to do*, *Learning to live together*, and *Learning to be* (UNESCO, 2012, p.13-15). In the field of education, this set of competencies should be seen as a goal instead of a standard as the framework supports teachers to develop a sense of meaning-making as well as the skill to reflect on a variety of learning experiences (UNESCO, 2012; Bürgener & Barth, 2017). In order to evaluate those four core areas in a deeper concept, those areas are compartmentalized into three other domains: the holistic approach, the envisioning change, and the achieving transformation (UNESCO, 2012). Those domains can be referred to the three teaching features that have been discussed earlier since they have the same learning perspective and objective. For example, the achieving transformation can be compared with the action-orientated approach as both involve the pedagogical concept of taking action by considering the questions of why and how they are doing this movement. In addition to that, they involve the envisioning of change with the same characteristics as the pluralistic approach because both methodologies make use of reasoning and meaning-making by analysing the significance of the given problem or issue regarding environmentalism (UNESCO, 2012; Rudsberg & Öhman, 2010). Consequently, this leads us to the fact that the right combination of teaching methodologies and pedagogical skills can be the key feature to change the world into a better world through implementing EfS effectively among the school system.

4. RESEARCH DESIGN AND ANALYSIS

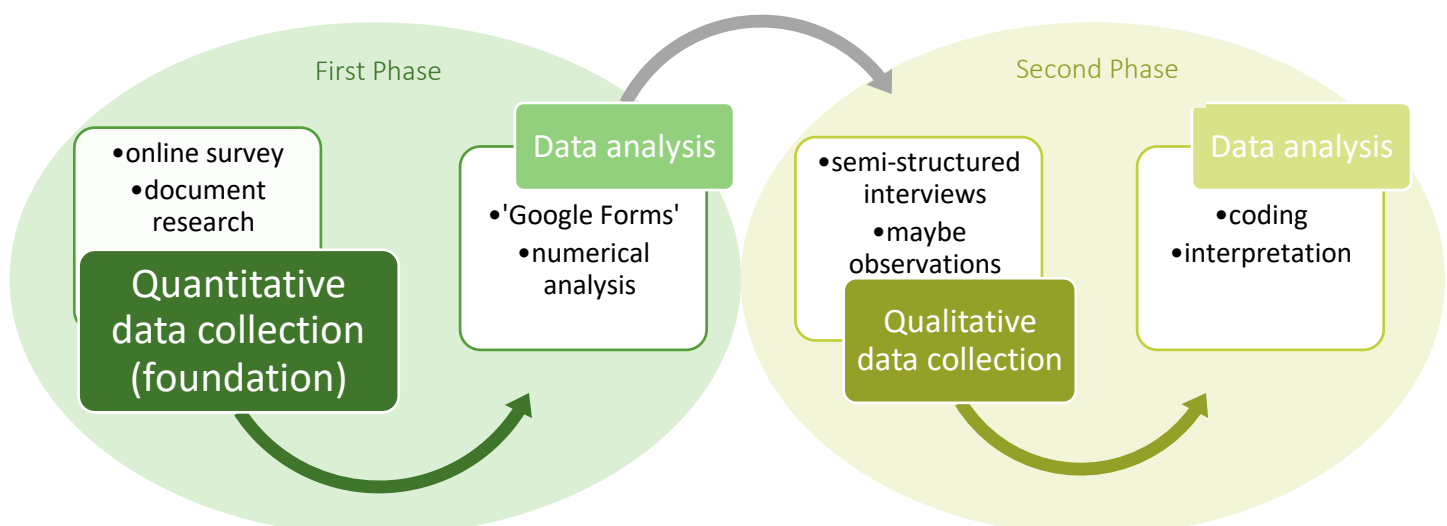
4.1 PARTICIPANTS AND CONTEXT

This study will be conducted at the XY IB-School in central Europe. The sample group will consist of all primary school teachers from grade 1 up to grade 5 including the leaders and principals as well as EAL and SEN teachers. However, it is not possible to state a specific number of participants due to the Covid-19 pandemic. Nonetheless, this research aims for a reliable outcome and refers therefore to a high number of participants. The XY IB-School in central Europe has about 33 employees. Therefore, the research estimates with at least 20 participants and hopes for more as all primary school teachers including the leaders, principals and specialists as well as EAL and SEN teachers are asked to participate. Additionally, it can be said that the primary school teachers from the XY IB-School in central Europe work with the same framework as every other IB-School around the world. Therefore, the research will consider teachers' years of experience in the field of the IB-Curricula and the general aspects of teaching about the sustainable dimensions.

4.2 RESEARCH METHODS AND METHODOLOGY

The research paradigm that will be used to conduct this study is the positivism research philosophy. Moreover, the research focuses on the mixed-method approach as it will combine quantitative data with qualitative data throughout the research. Therefore, the research focuses on the sequential explanatory design. Hence, the research study will have two phases to collect and analyse data (Ivankova, Creswell, & Stick, 2006). The two phases will build upon each other to increase the reliability of the research. The first phase focuses on the quantitative research approaches such as the online survey and the document research to set the foundation of this research. Once the quantitative data has been collected the findings will be analysed and used as a basis for the second phase that has a qualitative research approach (Ivankova, et. al., 2006). For the second phase, interviews will be conducted to prove and evaluate environmental components at the XY IB-School in central Europe. Furthermore, the interviews will clarify unclear sections about teachers' qualifications, values and beliefs when it comes to educating about sustainability. Consequently, the main focus of this research study is based on the positivism research philosophy, but it will include constructivism research philosophy to explain why variables of the first phase occur.

Picture 1. Sequential explanatory design. From Mayer, A., 2021.



Furthermore, this research study focuses on the hypothetical-deductive research as it is mostly based on facts and theories that will lead to clear outcomes (Baarda, 2014). The research study aims to have a positivist methodology and, therefore, a quantitative foundation. Henceforth, it is clear to say that this research has a quantitative research approach due to scientific research methods and the aspect of considering the world to be external and objective (Wellington, 2015). However, additional interpretative methods are used to verify and justify the outcomes of the first phase. Consequently, the research results will help primary school teachers to understand the main concept of how to teach EfS at schools by evaluating teaching approaches and competencies that are required to teach about EfS.

Furthermore, the research method that will be used to conduct this research is the epistemology as the research refers to subjective meanings and measurable facts. Due to this reason, this study uses the non-experimental design by referring to causality and social phenomena (Austin, 2016). Hence, the research needs not manipulate variables that lead to either agreement of the research hypothesis or a disagreement for the non-experimental design (Wellington, 2015). Considering the variables, the research will investigate the inquiry-based learning and teaching approaches from the existing IB-Curricula to analyse possible connections to ESD. By using this archived data from the XY IB-School, the research will automatically receive straightforward answers of how the sustainable dimensions are linked across the IB-Curricula system which refers to the third sub-question. Even though the data will be collected at the specific XY IB-School in central Europe, the results can be applied to other IB-Schools and therefore meets the aim of the positivist paradigm to create a 'generalizability' (Wellington, 2015).

Moreover, the survey will be conducted among all the primary school teachers of the XY IB-School in central Europe since the concept of the IB-Curricula involves everyone from the school community (Iborganization, 2020). The online survey will take place within the first five weeks of the teaching practice to ensure to complete participation of every participant. Furthermore, the survey will address teachers' perceptions, competencies, comprehension, and experiences about EfS. Once the survey is conducted the semi-structured interviews take place to verify the outcome of the survey as well as to clarify unclear sections about teachers' qualifications, values and beliefs when it comes to educating about sustainability. Hence, the combination of the survey and the findings of the semi-structured interviews provide information to answer the sub-questions one and two.

4.3 DATA COLLECTION

In order to increase the reliability and validity of this research paper, this research will combine two essential instruments: survey and document research for the first phase. Furthermore, to assure the validity of the survey, the research will apply additional interviews after the survey is conducted. By applying and combining multiple research instruments, the research paper will assure a high quality of databases as well as different perspectives to analyse the outcomes (Austin, 2016).

- Online Survey: Since surveys can be qualitative and quantitative, it is essential for this study to use closed questions to keep this research objectively measurable (Wellington, 2015). By choosing the quantitative approach, the research receives value-free and quantitative data from the participants. With the help of the survey, it is possible to ask numerous questions about the research question and the interrelated sub-questions, which gives flexibility and a wide range of data collection (Austin, 2016; Wellington, 2015).
- Document study: The official guide of the IB-Curriculum will be used to answer sub-question 3 and gives further input for suggestions and improvements in the field of ESD. Furthermore, the documents of the IB-Curricula can be seen as an additional source as they include: learning objectives and outcomes from grade 1-5, inquiry-based learning and teaching approaches among different subjects, summative and formative assessments, and possible developments in learner profile skills and abilities (Iborganization, 2020). The document study represents archival data as they have been published and shared among the IB-Schools.
- Interview: Interviews will be conducted to prove specific perspectives of the survey. Those interviews will help the research to identify components that are still unclear or need further explanations. Therefore, semi-structured interviews with a schematic schedule will be implied (SAGE Publications, Ltd., 2018). The questions in the semi-structured interview aim to answer the core question or questions that arise from the survey by using many associated questions that relate to the core question(s) (Wellington, 2015). Furthermore, by using semi-structured interviews it is possible to clarify information and to ask extra questions about details that come up throughout the interview that have not been anticipated (SAGE Publications, Ltd., 2018). In addition, the interviews will not take longer than 15 minutes.

4.4 ANALYSIS

Through applying methodological triangulation, it is possible to analyse and compare different data collection methods that evaluate the same research phenomenon (Wellington, 2015). The databases are collected and analysed separately but they will be compared and cross-checked to find out if they lead to the same outcome to enhance the validity of the research. Therefore, the mixed-method approach is used as the research follows the procedure of collecting and analysing both qualitative and quantitative data. The sequential explanatory design particularly combines the two types of databases in a productive scheme (Ivankova, et. al., 2006). Through following the procedure of the sequential explanatory design, qualitative data will be collected in the second phase of my research as a follow up to the quantitative data (Ivankova, et. al., 2006). This will help to verify the reliability of the online survey. Consequently, semi-structured interviews will be conducted for the second phase as the questions arise and refer to the collected findings of the survey and document research.

Since the research applies an online survey, the data can be stored and managed on a private server. By using closed-ended questions for the survey the findings are only quantitative and, therefore, easier to analyse and evaluate the findings of the survey (Wellington, 2015). For analysing the survey outcomes, codes will be used that occur from the IB-Curricula findings which have been scanned, sorted, and classified by the codes from the literature review (Austin, 2016). Furthermore, it is crucial to search for patterns to compare those to the existing research to find out similarities or variance indicators in the field of EfS (Wellington, 2015). Therefore, the research will use 'Google Forms' to send out the online survey privately. This program will sort the participants' answers in tables by applying numerical analysis.

Additionally, the semi-structured interviews will be recorded and stored to remember all the information. Furthermore, notes will be added for each interview to record important aspects and considerations that have been discussed (Wellington, 2015). Once the audios are transcribed, the transcripts will be evaluated by using the coding method. By applying this method, themes and topics will be identified that reoccur across multiple interviews as well as for patterns and unexpected surprises to evaluate the research question(s) (Austin, 2016). According to Austin (2016), it is important to consider missing data that might be expected but has not appeared throughout the second phase to assure every possible perspective of analysing databases.

Additionally, memos need to be evaluated through the same analysis method of coding. Hence, an Excel list will be created to sort and write down the findings. The findings of the first phase need to be added to see if both findings have similarities or differences (Ivankova, et. al., 2006). Through the comparison and interpretation of both findings, it will be possible to finalize the outcome of the research study by answering the main research question as well as the three sub-questions.

To show the deductive research approach, the study results will be represented by using tables, graphs and charts (Wellington, 2015). This will be helpful for the readers to understand the outcomes clearly by looking at the statistics and proves at the same time the validity of this research study. Nonetheless, it needs to be remembered that both research methods have equal value for understanding the research question regarding the teacher competence of teaching about environmental issues (Ivankova, et. al., 2006). Consequently, further information will be added to explain the quantitative data results by using the qualitative data findings.

4.5 QUALITY

To ensure the reliability and validity of this research paper, the research paper focuses on primary sources such as the survey and interviews as well on secondary sources with the document research of the IB-Curricula (Wellington, 2015). By using and applying both types of sources, the research findings will be balanced and credible (Austin, 2016). However, there are challenges and difficulties to consider when using primary and secondary sources. Primary sources are time-consuming as the data needs to be prepared, collected and analysed. By using the explanatory sequential design, it is important to do one phase after another including the analysis in between to determine which quantitative results need further investigation (Ivankova, et. al., 2006). Therefore, the research looks for particular variables regarding environmental issues and the interrelated competencies of teachers that occur from the survey and the document research. Those variables need to be reflected and then considered for the second phase of applying qualitative approaches such as the semi-structured interviews (Ivankova, et. al., 2006). This will help to save time and to verify and interpret the outcomes of both databases. In addition to that, a time schedule will be used to organize the preparation, data collection, and the analysis to minimize the time issues.

4.5.1 RELIABILITY

Moreover, the deductive reasoning of the literature review and document research can only be true if the inductive aspects are true and reliable (Wellington, 2015). Therefore, multiple resources have been used to ensure the quality and consistency of the literature review. The IB documents are published through the official International Baccalaureate Organization and represent therefore a high-quality resource. However, the number of IB-Curricula documents that will be provided from the XY IB-School are not clearly defined. In deference to this, it can be only predicted that the IB-Curricula documents include varied aspects of sustainability due to current research (Iborganization, 2020; Ortega & Taboada, 2018). Nonetheless, the expectation seems promising since the central IB-Curricula inquiries are based on real-life activities and students' knowledge and interest that might link sustainability (Iborganization, 2020).

4.5.2 VALIDITY

To increase the quality and validity of the research, the survey is purely based on the literature review as well as on the official documents of the IB-Curricula. To assure the validity of the study outcome, it is essential to make sure that all primary school teachers from the XY IB-School in central Europe participate in the survey. However, this can be challenging as the survey will have an anonymous process (Baarda, 2014). Hence, simple, understandable, and precise closed-ended questions are constructed and hypothetical questions, confusing questions, as well as leading questions are avoided to keep the research study objectively measurable (Wellington, 2015). Moreover, semi-structured interviews will be used to increase the validity of the online survey results. This is important for the second phase and the final outcome of the research because the results will reflect or deny the findings of the survey and the document research (Ivankova, et. al., 2006). Furthermore, the semi-structured interviews will help to strengthen the authenticity of the research by receiving further insights about primary teachers' perspectives, values, and meanings about Efs (Wellington, 2015).

4.6 ETHICS

It is crucial to reflect on ethical issues before doing research (Wellington, 2015). Moreover, ethical issues need to be minimized to assure a safe and engaging research environment at the XY IB-School. Therefore, attention must be paid to the phrasing and the design of this research by being thoughtful, respectful as well as reflective (Baarda, 2014). In addition to that, specific research methods will be considered that are specialized not to harm the participants in any way (Austin, 2016). Hence, it is necessary to have a clear outline of the research by considering possible ethical issues while creating and applying the research methods at the XY IB-School (Wellington, 2015).

The school will be introduced to the outline as well as asked if they support the research study by signing the permission form. In addition to that, every participant will get a consent form that clearly states the purpose of the study and the procedure of the data collected (See Appendix D). Indeed, everyone has the right to withdraw their consent or discontinue participation at any time.

The information that semi-structured interviews will be recorded needs to be mentioned in the permission form. However, the data will be stored in a way that every participant stays anonymous and to keep everything confidential throughout the research study. Besides that, it is to say that manipulations and ignoring data while analysing the data is unethical (Wellington, 2015). Therefore, the main focus will be on organizing that every participant including the researcher is non-judgemental throughout the research study. Furthermore, Austin (2016) emphasize that research must happen from a neutral perspective. Therefore, the researcher needs to stay detached and neutral regards to the bachelor thesis and the interrelated participants to guarantee valid outcomes.

5. PROCESS

5.1 TIME SCHEDULE

Month	Action	Date	Achievements
November	<ul style="list-style-type: none"> - Book: Education for Sustainability - Articles 	30.11.20 30.11.20	-Chapter: 1, 2, 3 -Amount: 6
December	<ul style="list-style-type: none"> - Book: Education for Sustainability - Book: Teaching the future EfS - Articles - Writing Part 1: 'Rational' - Meeting Thomas <u>Gitopoulos</u> (research-topic and lineout) 	23.12.20 29.12.20 29.12.20 28.12.20 04.12.20	-Chapter: 4, 5 -Chapter: 1, 2, 3, 4 -Amount: 10
January	<ul style="list-style-type: none"> - Writing Part 2: Theoretical Framework - Meeting Thomas <u>Gitopoulos</u> (research question, first draft) - Meeting TP-School (introduction to the research paper) - Articles - Writing Part 3: 'Process' - Meeting with Thomas <u>Gitopoulos</u> (final discussion) - HAND IN BACHELOR PROPOSAL - Meeting mentor teachers (sharing ideas) - Create Consent -Form 	03.01.21 06.01.21 13.01.21 15.01.21 16.01.21 21.01.21 25.01.21 27.01.21 31.01.21	-Amount: 6 -failed > adjusted
February	<ul style="list-style-type: none"> - Meeting TP-School (virtual) - Meeting with Thomas <u>Gitopoulos</u> - HAND IN BACHELOR PROPOSAL – RESIT - Arrive at TP-School - Receiving IB-Curricula documents - Start document research 	11.02.21 12.02.21 15.02.21 22.02.21 25.02.21 26.02.21	-passed ☺ -access provided
March	<ul style="list-style-type: none"> - Create survey - Send out survey - Meeting with Thomas <u>Gitopoulos</u> 	08.03.21 17.03.21 23.03.21	
April	<ul style="list-style-type: none"> - Close survey and analyse gathered data - <i>Maybe Observations</i> - Finalize document research - Write bachelor thesis (Part 6: 'Data Analysis') 	07.04.21 ----- 16.04.21 30.04.21	-25 responses -Not possible -coding, excel table -needed extra time!
May	<ul style="list-style-type: none"> - Meeting with Thomas <u>Gitopoulos</u> (check-up, analysis) - Conduct interviews - Transcription of interviews - Write bachelor thesis (Part 7: 'Conclusion') - Write bachelor thesis (Part 8: 'Further recommendation') - Share first draft of bachelor thesis - Meeting with Thomas <u>Gitopoulos</u> (final discussion) - HAND IN BACHELOR THESIS 	03.05.21 04.05.21 07.05.21 10.05.21 15.05.21 20.05.21 27.05.21 31.05.21	-5 interviews

5.2 SUPPORT

In order to be fully supported, Microsoft-Team's meetings are scheduled with the bachelor supervisor throughout the teaching practice. It is planned to meet once a month and when necessary, twice a month to discuss further steps of the bachelor thesis. To keep everyone up to date e-mails and chat forums are used. Furthermore, with help of friends and family, the researcher will receive further feedback on the writing skills. In addition, peers are asked to answer simple questions about the bachelor thesis through email contact. By the end of May, a first draft will be sent to the bachelor supervisor to discuss possible adjustments that need to take place before handing in the final bachelor thesis.

5.3 PROFESSIONAL DEVELOPMENT

For my professional development, I would like to focus on my subject knowledge and methodological competency as I am researching an essential topic. I am looking forward to acquiring and developing new knowledge in the field of sustainability as well as to use a combination of teaching approaches in my future career. By applying the mentioned research methods, I will learn how teachers are supported and how they apply the teaching approaches in practice. By analysing and questioning the findings of the research I will get the chance to reflect and maybe readjust my teaching style. Furthermore, it is interesting to see how EfS is implemented at IB-Schools as the International Baccalaureate has been my favourite curriculum thus far.

In addition to that, I would like to work on my competency for organizational development as the research study needs a well-structured plan to be successful. By applying the sequential explanatory design, I must be strict and organized to follow the two phases of collecting data. Otherwise, this might have a negative impact on the research paper. Moreover, time-issues are not helpful in the way of staying calm and professional towards the research study. Therefore, I will strictly follow my plan and try to see and consider obstacles in advance to avoid negative impacts on my bachelor thesis.

6. DATA ANALYSIS

Due to the sequential explanatory design, the results of the data analysis are represented in three sections. The first section focuses on the gathered information from the document research. The second section highlights the outcomes of the conducted survey and the interrelated charts and graphs that lead to the third section that focuses on the results of the interview. The analysis focuses only on the data that has been collected at the XY IB-School in central Europe.

In addition, it needs to be said that the XY IB-School in central Europe works towards a more sustainable school regarding lesson content and school philosophy. Throughout the online survey, it was clear to see that the school slowly changes their perspective towards educating about sustainability as many teachers were highly interested to learn more about the topic itself. Moreover, the investigation within the school environment showed obviously an encouraging view to make a change regarding their modified International Baccalaureate framework. Therefore, the analysis has optimistic outcomes regarding the XY IB-School in central Europe and some stimulating facts about the globally knowledgeable International Baccalaureate Organization.

6.1 CAUSES OF DEVIATIONS/LIMITATIONS

The document analysis, as well as the online survey, were conducted as planned. However, the interviews took place both online and in-person due to the Covid-19 pandemic. The school lockdown only allowed graduation classes to stay in the school building. Therefore, most of the homeroom teachers have been working from home except for the grade 5 teachers, leaders, and specialists. Moreover, it was planned to conduct observations. However, due to the Covid-19 pandemic, the observations have been cancelled. Consequently, they have not been considered throughout the analysis and conclusion.

Further limitations have occurred due to the number of participants. The XY IB-School in central Europe has about 33 employees including all primary school teachers, the leaders, principals, and specialists as well as EAL and SEN teachers. Therefore, the sample size was relatively small. Nonetheless, the research reached a participation of 75,75% which is still accreditable but small compared to usual research papers (Austin, 2016).

In addition, there could have been limitations to the research as the deductive reasoning of the literature review and document research can only be true if the inductive aspects are true and reliable (Wellington, 2015). Henceforth the research evaluated only official IB-documents that have been published from the Baccalaureate Organization itself. Therefore, the limitations of having an unreliable research framework have been prevented.

Moreover, the semi-structured interviews have been challenging as the process of applying and evaluating the data was time-consuming. However, the outcomes have been beneficial for research because the participants had the chance to express their views about Efs throughout the interviews (Austin, 2016). Additionally, the findings could have been less objective if the interviewee would have not followed the same order of questions throughout each interview. Hence, a schematic schedule has been created to retain the main structure of the interview and to keep the research validity and reliability. In the end, the semi-structured have been helpful to verify and compare the outcomes of the first phase of the mixed method approach (Baarda, 2014).

6.2 DOCUMENT ANALYSIS

For the first phase of the sequential explanatory design, a document analysis was conducted. The degree of access is restricted as the documents were only available through special permission from the XY IB-School in central Europe. Through the permission and availability to access the official IB-documents (secondary source), it was possible to investigate the frameworks for teaching and learning, concepts of the learner community and the learner-profiles.

According to Wellington (2015), every secondary source should be analysed and checked by using a criteria list that helps to analyse and evaluate the secondary source. He highlights seven criteria which are called: 'context, authorship, intended audiences, intentions and purposes, vested interests, genre, style and tone, presentation and appearance' (p. 213-214). Looking at the given documents from the IB-Curricula, it was clear to see that the seven categories were met accordingly and appropriately. The documents are written and published by the International Baccalaureate Organization in 2019. Furthermore, the International Baccalaureate Organization is known as a high-quality educational program from early primary up to the diploma years (age 3 to 19) (International Baccalaureate Organization, 2014). In addition, it needs to be mentioned that the documents are globally acknowledged and regularly updated for IB-Schools around the world for over 50 years. The IB-Schools can use the documents as PYP resources to plan, organize and structure their learning and teaching outcomes. Those three guideline programmes are compartmentalized into other domains to include subtopics that verify the International Baccalaureate program and its philosophy.

TABLE 1, IB-DOCUMENTS

The IB-documents from the PYP resource center		
Learner-profile (LP)	Learning and teaching (LT)	Learning community (LC)
Learner agency	Transdisciplinary learning	A community of learners
The early learner	Approaches to learn	International-mindedness
Learner profile	Inquiry	Leadership
The exhibition	Concepts	Collaboration
	A transdisciplinary programme	Learning environments
	Assessment	Technology in the PYP
	Language	Glossary
<i>Total pages: 51</i>	<i>Total pages: 105</i>	<i>Total pages: 73</i>

Furthermore, the document analysis included other files to investigate deeper content regarding the different subjects and themes across the IB-Curricula. The *Scope and Sequence* documents relate to themes that include arts, language, mathematics, science, social studies, personal, social, and physical education. Those documents are important and useful for this research in order to compare the general IB-philosophy of Table 1 with the different learning continuums of Table 2.

TABLE 2, SCOPE AND SEQUENCE DOCUMENTS

Scope and Sequence documents from the PYP resource center					
Art (AT)	Language (LG)	Mathematics (MT)	Personal, social and physical education (PSP)	Science (SC)	Social studies (SS)
<i>Total pages: 30</i>	<i>Total pages: 37</i>	<i>Total pages: 42</i>	<i>Total pages: 30</i>	<i>Total pages: 45</i>	<i>Total pages: 56</i>

The content of the documents has been analysed through a coding approach. The codes have been chosen and collected from the literature review to assure a high quality of research. It was important to choose codes that link to the three sub-questions as well as to the main research bachelor question to evaluate the possible outcomes. Therefore, codes such as sustainability, sustain, environment, economic, dimension, cultural, ecological, social, cultural, holistic, action, and pluralistic have been chosen (See Appendix A). Additionally, the codes have been colourfully coded according to the consistency of appearance. Hence, the four different colour code sections have been used to differentiate the significance of each statement (Table 3).

TABLE 3, COLOUR CODES FOR DOCUMENT ANALYSIS

Colour codes:	Clear connection to sustainable aspects	Possible interpretation about sustainable aspects	No connection regarding sustainability	Not mentioned
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This was necessary as the International Baccalaureate is based on an interpretative and open-minded philosophy regarding teaching and learning with a PYP framework. Consequently, it was important for this research to not only focus on the consistency of appearance and the significance of the statement but also to clarify and evaluate the relevance regarding sustainability and the interrelated environmental issues.

The aim of using the specific codes and the colour coding of the results is to systematically categorize the findings to find out the frequency and themes of patterns (Wellington, 2015). The analysis indicates that the IB-documents were not fully linked to sustainable facts and dimensions. In Table 4 we are able to see that the green links have been quite rare among the IB-documents as well as with the *Scope and Sequence* frameworks. The fact that the blue column has the most matches is no surprise as the IB-Curricula is based on interpretational learning frameworks. Even throughout the interview with the PYP coordinator, it was emphasized that the PYP framework represents an open book that needs to be interpreted and adjusted according to the given needs and requirements of the XY IB-School in central Europe.

Consequently, it was no surprise that the documents have been quite general about sustainability itself. Nonetheless, the IB-Curricula prioritizes the action taking approach. Throughout the coding, it was easy to analyse that the code action appeared quite frequently (See Appendix B). However, this is due to the current changes of the IB itself. The new philosophy of the International Baccalaureate is to implement the action and agency approaches across the six units of inquiry and throughout the year instead of working on the approaches individually (Iborganization, 2020). Therefore, the action approach is now officially one of the essential parts within the IB-System and therefore mandatory for each teacher to use and implement it throughout the six units of inquiry (International Baccalaureate Organization, 2014). This is a positive change regarding implementing sustainability successfully across the IB-Schools because Bürgener & Barth (2017), emphasize that theoretical knowledge must be combined with practical skills when it comes to EfS.

Moreover, the analysis shows that even in subject related documents the connection to sustainability is missing. The teaching frameworks *Scope and Sequence* is supposed to help international primary school teachers to plan and organize a unit within interrelated learning objectives. However, the amount of appearance of the green links indicates that teachers have no full guidance when it comes to teaching about sustainability and the interrelated environmental issues. There are some links but generally not enough to plan a unit based on sustainable facts and dimensions. Consequently, the official documents are not necessarily helpful regarding possible teaching approaches when it comes to educating about environmental issues. In order to prove this outcome within a deeper context, interviews have been conducted to evaluate teachers' opinions regarding the International Baccalaureate support.

TABLE 4, RESULTS OF THE DOCUMENT ANALYSIS (FREQUENCY)

IB-documents:	Amount:	Amount:	Amount:	Non-relevant/ Repeated	Not mentioned
Learner-profile (LP)	7	14	16	6	Pluralistic
Learning and teaching (LT)	11	14	21	9	Pluralistic
Learning community (LC)	9	15	15	1	Pluralistic

Scope and Sequence:	Amount:	Amount:	Amount:	Non-relevant/ Repeated	Not mentioned
Art (AT)	0	5	3	0	Dimension, Economic, Ecological, Holistic
Language (LG)	0	5	7	0	Economic, Ecological, Holistic
Mathematics (MT)	0	3	3	0	Dimension, Economic, Ecological, Social, Holistic
Personal, social and physical education (PSP)	6	5	3	0	Dimension, Economic, Ecological, Holistic
Science (SC)	8	11	6	0	Dimension, Ecological, Holistic
Social studies (SS)	7	13	8	0	Ecological, Holistic,

6.3 SURVEY ANALYSIS

In addition to the first phase of the sequential explanatory design, a quantitative online survey was sent out to all primary school teachers from grades one to five including the leaders, principals and specialists as well as EAL and SEN teachers (Appendix C). In the end, 25 primary school teachers have signed the consent form and participated in the online survey. Therefore, the online survey represents a qualitative data resource as 75,75% of the sample group participated (Wellington, 2015). The online survey consisted of 16 closed questions that included 2 multiple-choice, 7 polar questions and 7 scale questions. In addition, the questions have been categorized according to the three sub-questions. The participants had to answer 5 questions about the teaching approaches, 5 questions about competencies that need to be developed to implement EfS successfully and 5 questions that were related to the IB-Curriculum framework.

2. Do you know what 'SDG' stands for?

25 responses

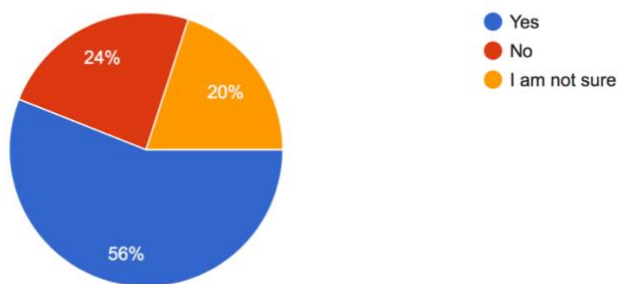


FIGURE 1, SURVEY QUESTION 2

Responses that are represented in Figure 1 analysed the awareness of the United Nations Sustainable Development Goals (SDG's) that embody the main goals of sustainability since 2015. It is clear to see that most of the participants knew about the SDG's. However, about 44% do not know or are even unsure about the meaning of the SDG's. This could be due to the IB-documents as those do not emphasize the topic sustainability throughout the teaching frameworks, learning guidelines and the scope and sequences. In addition, it could be linked to the fact that the SDG's are not highlighted throughout a teacher education course. In particular, the statistics of Figure 2 show that only two primary school teachers experienced a sustainability course within their educational pathway before they started working as international primary school teacher.

6. Was the topic sustainability part of your personal teacher education course? (University)

25 responses

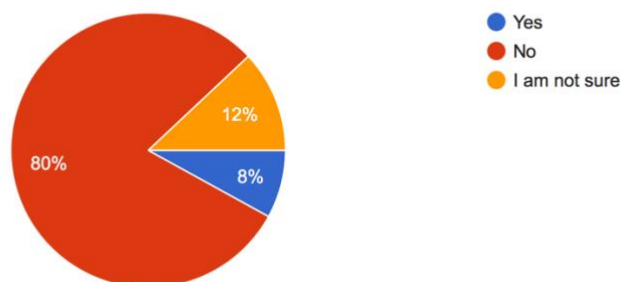


FIGURE 2, SURVEY QUESTION 6

Consequently, most teachers start working without a fundamental background about sustainability. It truly depends on the school or the teacher itself to acquire and expand their knowledge towards sustainability and the interrelated environmental issues. Probably, most participants are only aware of sustainability due to personal interest by learning and remembering the facts from the current news that are displayed in the press or on social media. This leads us to the fact, that most teachers teach about sustainability only by using personal experiences or common facts that have been highlighted in the news.

7. Did you have the chance to join a workshop about sustainability?

25 responses

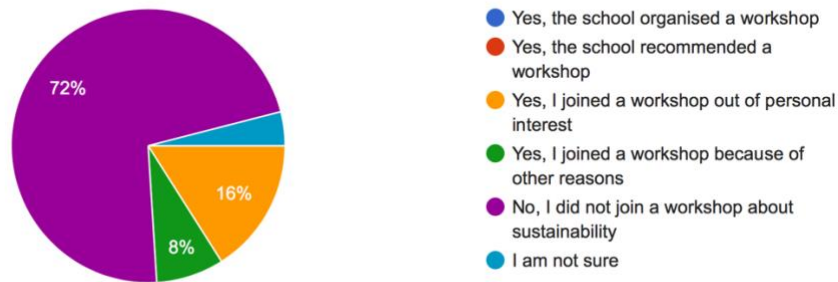


FIGURE 3, SURVEY QUESTION 7

The responses in Figure 3 illustrate that none of the teachers had the chance to join a workshop that was organised by the school. This connects and underlines the outcomes of Figure 1 and Figure 2 and indicates that most participants are not aware of the sustainable dimension and the interrelated environmental issues. This might be seen across other IB-Schools as the document analysis has shown that the IB-Curricula does not implement sustainability successfully across the different frameworks.

Therefore, it is no surprise that about 56% (Figure 4) of the international primary school teachers struggle to implement and enhance sustainability across their six units of inquiry. The statistics indicate that teachers might not feel comfortable or even confident enough to educate about sustainability. The goal to achieve the right balance of acknowledging the sustainable dimensions in and outside of school by evaluating the validity and significance is essential to reach best practice in EfS (Swiniarski & Breitborde (2000); Sinakou, et al., (2019).

3. To what extent are your lessons related to sustainable content (e.g. facts, dimensions, SDG's, etc.)

25 responses

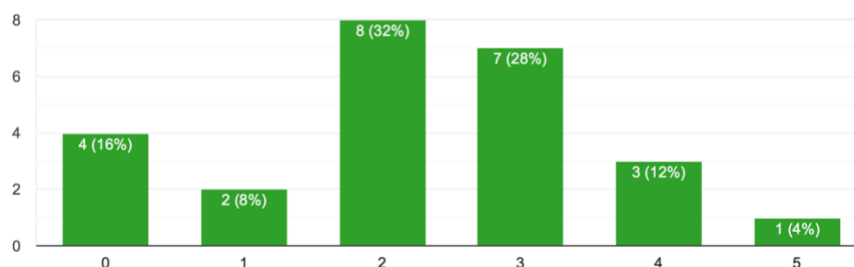


FIGURE 4, SURVEY QUESTION 3

Nonetheless, 84% of the participants are interested and willing to expand their knowledge and skills to become more familiar with environmental issues and their dimensions (Figure 5). This positive reaction seems promising to work towards a more sustainable school environment. The responses clearly highlight the fact that international primary school teachers are motivated to use education as a key to make a change. Hence, it would be helpful to support and encourage the teachers to expand their knowledge about sustainable facts and dimension by using the right combination of teaching methodologies (Nolet, 2016).

10. Are you personally interested to learn more about the SDGs?

25 responses

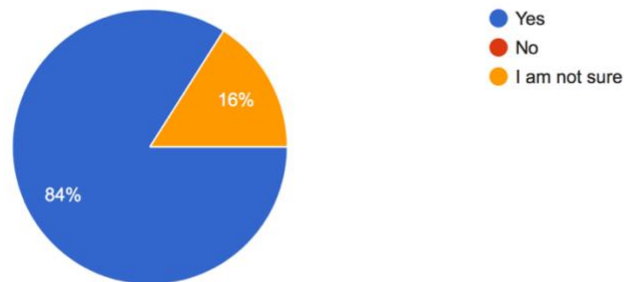


FIGURE 5, SURVEY QUESTION 10

In addition to that, the online survey included specific questions about IB framework and the IB-resources to evaluate teachers' satisfaction. The statistics show that the satisfaction of the international primary school teachers is not well-balanced. Some of the participants agree or stay neutral regarding the International Baccalaureate (See in Figure 6, 7, and 8). This could be due to the IB-Curricula being designed to have an interpretative groundwork that can be seen as an umbrella of best practice. Consequently, each international primary school teacher has a different perspective regarding the given learning and teaching frameworks.

Moreover, the uncertainty of different meanings regarding the learning objectives could lead to the outcome that most participants tend to stay neutral or even in the lower satisfaction rate. Those uncertainties about further support from the IB-Curricula are sobering. International primary school teachers should be well equipped when it comes to educating about sustainability (Bürgener & Barth, 2017). Therefore, it was crucial to evaluate teachers' beliefs and values regarding further support from the IB-Curricula within a deeper context by conducting semi-structured interviews.

12. How satisfied or dissatisfied are you with the IB-Curricula framework regarding sustainability?

25 responses

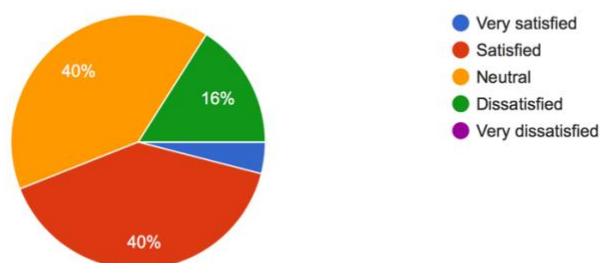


FIGURE 6, SURVEY QUESTION 12

13. How satisfied or dissatisfied are you with further support of the IB-Curricula framework regarding sustainability?

25 responses

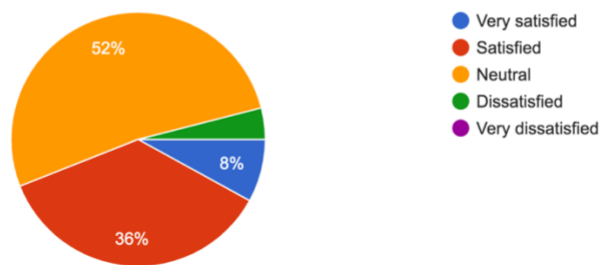


FIGURE 7, SURVEY QUESTION 13

14. How satisfied or dissatisfied are you with further resources of the IB-Curricula framework regarding sustainability?

24 responses

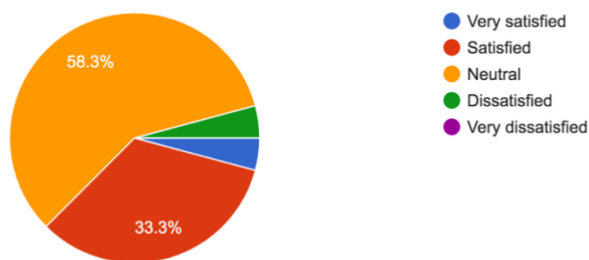


FIGURE 8, SURVEY QUESTION 14

6.4 INTERVIEW ANALYSIS

The schematic schedule of the semi-structured interviews allows for a balanced conversation because of the structured and standardized questions (SAGE Publications, Ltd., 2018). Therefore, the questions have been chosen to clarify follow up questions from the online survey regarding teachers' perspectives about implementing sustainability successfully across the six units of inquiry. Furthermore, the questions have been structured to analyse teachers' beliefs and expectations about educating sustainability to evaluate the needs of teachers at the XY IB-School in central Europe.

The interview with the PYP-Coordinator revealed that the XY IB-School in central Europe is starting to implement sustainability across the six units of inquiry. However, it is the first time that *'[...] they have a PYP coordinator and pretty much full time, but it has helped or will help as well.'* (P5). This indicates that the international primary school teachers will receive a better overview of everything to see and understand the different expectations of the IB-Curricula. Furthermore, the school is putting its focus on possible options and ideas of enhancing EfS within the school community. In particular, the PYP-Coordinator aims to work with the SDG's more frequently by building a programme of inquiry all the way up from the EYP up to grade 5. In addition to the PYP coordinators statement, all the other international primary school teachers agreed on the

point that sustainability should and must be implemented within primary education. As some state: *'But yeah, it doesn't have to be our older kids. Our littlest kids are going to be the biggest change.'* (P1). From that point onwards it is clear that the international teachers from the XY IB-School in central Europe are ambitious to make a change by teaching about sustainability among primary school students.

Moreover, P3 even emphasizes that *'[...] the younger the kids, the better. They will realize that this is an important message. The more likely it is that there's going to be some changes.'* It is fascinating to analyse that the international primary school teachers are encouraged to make a change, but struggle to take action due to missing knowledge and competence when it comes to educating about sustainability. The need of receiving further professional development is fundamental in order to assure high quality of teaching (Bürgener & Barth, 2017). Most of the participants mentioned in the online survey and throughout the interviews that they would appreciate further education about sustainability to enrich the students' needs and willingness to learn about current and important topics such as environmental issues. For example, participant 2 states: *'I think to myself I probably would like to go and educate myself more. To be honest, I think I know a lot of things just from teaching for a while you learn a lot of stuff. But I think sustainability has not been my main priority as much.'* Hence, the international primary school teachers are willing to adapt to implement new ideas and to pursue best practices when it comes to EfS. However, to make a change we need to develop a more suitable framework as it *'will benefit not only the kids but all of us, I think.'* (P5).

Furthermore, the participants agreed that knowledge is the key. However, they state that they struggle to find suitable information for specific age groups. The topic sustainability is broad and needs proper guidance in terms of professional development as not all ideas are good for our students. It is difficult to find appropriate information regarding sustainability as even the *Scope and Sequence* frameworks from the IB-Curricula do not include useful links for the six units of inquiry. For example, the structure of IB-Curricula and the PYP for the primary schools is really open for interpretation as the PYP framework *'doesn't say you have to teach this, or you have to teach that. So, I think it's too open sometimes.'* (P5). Therefore, further emphasis has been revealed to receive more structure and organizations regarding learning objectives. A good structure would be beneficial not only for students but well as for the teachers. In the beginning of a changing process, it is especially crucial to receive further support and guidance to plan and structure appropriate lines of inquiry. This can be done through the help of the *Scope and Sequence* frameworks since every international primary school teacher needs to plan and work with the given learning objectives for the six units of inquiry. This suggestion has been shared across each participant throughout the interview. In particular participant 2 states: *'If it was within the scope and sequence, I would be able to know to cover this lesson objective. But I think from the top of my head as you said there is not as many as you would like. There are many things that need to be updated.'* Therefore, not only the school needs to change their personal learning frameworks, the IB-Curricula itself needs to be updated as well. This would be beneficial for everyone as participant 3 states: *'One of the hard things about being a teacher is sometimes you feel like you need to reinvent the wheel.'* (P3). Consequently, the IB-Curricula should be more connected to global perspectives including SDGs to enhance powerful learning, because *'teaching is about global thinking and IB is a global thinking system so that should be fostered into it.'* (P4).

7. RESEARCH CONCLUSION

This study aimed to investigate the research question: *To what extent are international primary school teachers in the IB curriculum qualified to teach environmental issues?* The evaluation of this research was done through qualitative and comparative research analysis. The aim was to highlight the importance of implementing sustainability throughout the primary school years successfully as education should be seen and used as a key to make a change (Nolet, 2016).

With the collected data from the document research and the online survey for the first phase of the explanatory design, it was possible to identify that sustainability is not fully integrated and EfS is not maintained throughout IB-Curricula and the six units of inquiry. It seems controversial as the International Baccalaureate Organization represents a modern and powerful institute. However, the frameworks and the guidelines have not been adjusted to the worldwide sustainable expectations (SDG's). Especially nowadays when sustainability and environmental issues are largely discussed they should be involved in the learning frameworks (Bürgener & Barth, 2017). Consequently, it can be said that the international primary school teachers are not well equipped to teach about sustainability in the IB-Curriculum.

By using and following the right teaching approaches international primary school teachers will have it easier to educate about sustainability. The literature review emphasizes a holistic, pluralistic and the action taking approach that is suitable and successful EfS (Taylor, et al., 2015). The action taking approach is truly highlighted within the IB-Curricula even when it is not clearly connected and related to sustainable facts. Moreover, students need to learn to take agency to explore and develop pluralistic perspectives that relate to the six units of inquiry. Another objective of the IB-Curricula is to encourage the students to research and sort the new information of the inquiries. Hence, the IB-Curricula does work with the correct teaching approaches that have been suggested in the literature review. However, they must be further reinforced to support students' understanding while working with sustainable dimensions including economic, social and environmental aspects (Sinakou, et al., 2019; Wolff, et al., 2017).

The participants represent a mixed group of individuals and everyone has their own personal perspectives on EfS with and without knowledge about sustainability. This is due to the fact that international primary school teachers are becoming more familiar with the topic because of personal reasons or school intentions. However, it will be not enough to just count on personal experiences and common knowledge. It is crucial to understand why and how sustainability can be enhanced across the whole school community (Boeve-de Pauw, et al., 2015). As the online survey shows, teachers are not confident enough to educate about sustainability. Nonetheless, most participants stated that they are willing to pursue best practice if they get the chance to learn and develop the required competencies. The IB-System does not have specific guidelines about the needed requirements when it comes to EfS. Therefore, it is more than essential to support our international primary school teachers so that they can develop fundamental knowledge and competencies when it comes to educating about sustainability.

Consequently, the school should create approaches where everyone can join and share their knowledge without feeling humbled. By creating shared points, the teachers will get the chance to share and contribute their existing knowledge regarding educating about sustainability. Additionally, the outcomes indicate that the participants strive to receive more ideas and fundamental approaches that link to sustainable aspects within the six units of inquiry. In particular, the PYP coordinator aims to become more sustainable by using the SDG's. However, it will take some time to adjust the school philosophy as well as the lesson frameworks across any age group. Nonetheless, this action process should be seen as a whole school approach. Everyone from the school community should be involved to contribute best practice for EfS. However, this can be only done through the help of extra specialists that are trained to educate and coach everyone in the school community about sustainable dimensions and the interrelated environmental issues.

8. FURTHER RECOMMENDATIONS

This research should encourage readers and researchers to adapt, improve or re-invent their perspective regarding environmental issues.

Firstly it is important for international primary school teachers to receive further professional to acquire the necessary knowledge and competencies about EfS. Materials and facilities are not useful if the international primary teachers do not have the qualification to teach about sustainability. The literature review as well as the current studies about sustainability emphasize the importance of creating a fundamental foundation of knowledge to be qualified to teach about environmental issues (Taylor, et al., 2015). Therefore, it is crucial to generate a sustainable awareness and consciousness among the school community by seeking professional support from experts (Boeve-de Pauw, et al., 2015). Once the knowledge is gained, it would be beneficial to implement materials and facilities such as science labs and books.

In addition, Wolff, et al. (2017) emphasizes that it is essential to have a purposeful high quality when it comes to educating about sustainability. This could be achieved through qualified workshops, further teaching resources, sharing platforms and many other teaching tools. Nonetheless, the supporting part should be seen as a regular and steady learning process because the world and the needs of the teachers will change over time (Nolet, 2016). Consequently, international primary school teachers should receive professional development that is adjustable and flexible regarding the given environmental issues and the needs of the teachers and students.

Moreover, it is important to focus on teachers' competencies. Setting up an open learning environment for students and teachers to explore real-life examples will help to develop the necessary competencies that have been described in the literature review by Bertschy et al.(2013). It would be beneficial to compare the ECE competence model with the PYP framework methodologies to analyse possible connections within a deeper context. The comparison results could be linked and used for further implications with the six transdisciplinary themes. In particular, in the field of education, it is necessary to combine knowledge with meaning-making by exploring and reflecting on a variety of learning experiences (UNESCO, 2012; Bürgener & Barth, 2017).

According to Bürgener & Barth (2017), teachers need to have an environment that involves transdisciplinary aspects that involve laboratories to physically explore the transition of knowledge while experimenting. Nonetheless, the international primary school teachers need to adjust their lessons and contents to the SDG's and according to the students' interest. Choosing the appropriate topics in the context of EfS will help the teacher to gain students' curiosity. Once curiosity is gained teachers have achieved a milestone of changing and making the world into a better world. Most children love to share their knowledge especially when they are young. Another suggestion would be to include the parents in the changing process of EfS. Children are sharing their learning process with the parents at home by using different ways. Most of the sharing is happening unconsciously through simple conversations or daily habits. Because of this, it is even more important to educate young and engaged students about sustainability and to involve the parents actively through projects or activities. Parents could be included in further research by conducting interviews or surveys that evaluate parents' perspectives on implementing sustainable aspects at home together with their children.

In the end, the XY IB-School in central Europe has several opportunities to take this research a step further. The outcomes are helpful and beneficial in the way of readjusting the learning and teaching frameworks within the school by considering the wishes and suggestions from the online survey as well as from the semi-structured interviews. In conclusion, primary education should be seen from a wider angle as learning goes beyond the school. Therefore, the different environments should be used as an active learning environment to adjust the school, teacher, and student philosophy about sustainability. Hence, education is the key to generate worldwide awareness on how we could save the world!

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APPENDIX A – DOCUMENT ANALYSIS

Codes	Document	Page	Content – IB Documents	Curricula	Colour Code
Sustainability	LT	5	IB-Learner Profile: Inquirers (We learn with enthusiasm and sustain our love of learning throughout life.)	PYP	2
	LT	4	New approach in education: UNESCO, Education for sustainable development	PYP	1
	LT	3	Subject groups/inquiries, total 8	MYP	3
	LC	14	Sustained inquiry: reaching locally, globally, and nationally problems and issues	PYP	3
	LC	14	Sustainable development in inquiry, action and reflection	PYP	1
	LC	23	Effective leadership aims to create school sustainability	PYP	1
	LC	23	Sustainable leadership is best supported by long-term succession planning	PYP	2
	LC	60	Concepts in technology. Responsibility: Safety, ethics, sustainability	PYP	1
	LP	31	Examples, type of action: Social entrepreneurship, address challenges and opportunities in innovative, resourceful and sustainable ways.	PYP	1
	LP	31	Examples, type of action: Lifestyle choices, Making positive lifestyle changes in response to learning. engaging in responsible and sustainable consumption (for example, making informed decisions surrounding food, energy, water, materials usage).	PYP	1
	LP	33	Move towards to: Action that is sustainable	PYP	1
	LP	33	Supporting action” can be used, in a flexible way, to reflect on the appropriateness of support provided at different times, in different ways and to varying degrees.	PYP	3
	LP	36	A PYP student who takes action for a better and more peaceful world: I take responsible action for a more peaceful and sustainable world.	PYP	1
	LT	50	Association with the concept "change and responsibility"	PYP	3
	LC	20	Develop a learning environment sustained by effective structures, organizational practice and resources	PYP	2
	LP	22	sustained inquiries, students gain the knowledge, conceptual understandings, skills and dispositions to contribute to, and make a difference in, their own lives, their communities and the wider world.	PYP	2
Environment	LT	11	Transdisciplinary themes: How the world works, the impact of scientific and technological advances on society and on the environment.	PYP	3
	LT	11	Transdisciplinary themes: How we organize ourselves, economic activities and their impact on humankind and the environment.	PYP	2
	LT	16	Adopted new approach: to address complex projects relating to real-world topics around built and natural environments.	PYP	1
	LT	16	Adopted new approach: to address societal problems and to find solutions to environmental, social, economic and cultural challenges	PYP	1
	LT	17	Exhibition related topics that included the environment (23%)	PYP	1
	LT	34	ATL-Research skill: Reflection and metacognition, Have I been a principled and balanced thinker? (for example, considering ethical, cultural and environmental implications).	PYP	2
	LT	35	ATL-Communication skill: Exchanging information, Communicate with peers, experts and members of the learning community using a variety of digital environments and media.	PYP	3
	LT	49	Key Concepts: The key concept of “connection” could focus the unit on how the characteristics of the species connects to features of the environment to ensure survival.	PYP	3
	LT	52	Key-Concept, The central idea “Over time, living things adapt to their unique environments”	PYP	3
	LT	53	Central ideas for subject-specific inquiries. “Over time, living things adapt to their unique environments”	PYP	3
	LT	58	Transdisciplinary themes: address contemporary opportunities and challenges surrounding environment, development, conflicts, peace, rights, and governance	PYP	2

	LT	64	Teaching style: Students learn from their environments, people around them, seeing experts at work, questioning and reflection, with little need for specific knowledge instruction	PYP	2
	LP	6	Learning environments related to students sociocultural context	PYP	2
	LP	31	Types of action: Advocacy, Taking action individually or collectively to publicly support positive social, environmental or political change.	PYP	2
	LP	34	Action & Learner Profile. Central idea: Humans make choices that have an impact on the environment.	PYP	1
	LC	1	communicate effectively within and beyond the school environment.	PYP	2
	LC	8	Between-class-learning: "The design of buildings and structures is dependent upon the environment and natural resources"	PYP	2
	LC	35	Supported Learning experiences: Scientific lesson on the impact of environmental changes on habitats.	PYP	1
Dimension	LC	14	exploring global concerns at a developmentally appropriate level, including the environment, peace and conflicts, rights and responsibilities, migration and displacement, and governance across a variety of geographical and cultural dimensions	PYP	1
	LT	4	Holistic learning: extends the international dimension of the PYP, the themes have global significance—for all students in all cultures and all places.	PYP	3
Economic	LT	4	Problems that crossed national boundaries and were interconnected culturally, ecologically, politically, economically and technologically, led to the focus on transdisciplinarity as a means to integrate the curriculum and as a philosophy to differentiate the PYP from other curriculums	PYP	1
	LT	11	Inquiry: How we organize ourselves, economic activities and their impact on humankind and the environment.	PYP	1
	LT	16	Adopted new approach: to address societal problems and to find solutions to environmental, social, economic and cultural challenges	PYP	
	LT	57	Transdisciplinary themes: Culturally, Ecologically, Politically, Economically, Technologically	PYP	1
Ecological	LT	4	Transdisciplinary themes: problems that crossed national boundaries and were interconnected culturally, ecologically, politically, economically and technologically	PYP	
	LT	57	Transdisciplinary themes: Culturally, Ecologically, Politically, Economically, Technologically	PYP	
Social	LT	9	Embrace both personal and social significance, "the transdisciplinary themes provide..	PYP	2
	LT	11	Transdisciplinary themes: Who we are, nature of the self; beliefs and values; personal, physical, mental, social and spiritual health; human relationships including families, friends, communities and cultures; rights and responsibilities; what it means to be human	PYP	3
	LT	15	learning community reflect on their diversity through language, they move beyond the traditional national, cultural and social boundaries in their daily lives to develop international-mindedness.	PYP	3
	LT	16	Adopted new approach: to address societal problems and to find solutions to environmental, social, economic and cultural challenges	PYP	
	LT	63	The role of subjects: wonder at the natural and physical world, and celebrate the diversity of their social worlds.	PYP	2
	LC	15	Expanding intercultural understanding to extra- curricular activities: from different cultures, nationalities and social backgrounds	PYP	2
	LC	39	Use technologies in ways that are socially and ethically responsible and that contribute to the global learning community.	PYP	3
	LC	43	Early space design: Learning spaces reflect young students' social—cultural worlds where family, identity and languages are represented through the use of pictures, artifacts and displays.	EYP	3
	LC	60	Concepts in technology. Change; Development and system: How has this technology changed social or environmental systems?	PYP	2
	LP	8	By actively facilitating a student's meaning-making, the physical and social environment engages students in rich and developmentally responsive ways.	PYP	2

	LP	9	Through play, children actively construct meaning from their interactions with their physical and social worlds.	PYP	3
	LP	31	Examples, type of action: Advocacy, Taking action individually or collectively to publicly support positive social, environmental or political change.	PYP	2
	LP	31	Examples, type of action: Social entrepreneurship, Supporting positive social change through responding to the needs of local, national and global communities	PYP	3
	LP	32	Questions to consider to take action: How are students encouraged to consider the multiple forms of action: participation, advocacy, social justice, social entrepreneurship, lifestyle choices?	PYP	2
Cultural	LP	6	Students need to understand the important influence of their sociocultural contexts	PYP	3
	LP	9	Play provides benefits for cognitive, social, emotional and physical development for students from all socio- economic, cultural and linguistic backgrounds	PYP	2
	LP	22	Being willing to see beyond local boundaries is also essential for intercultural understanding.	PYP	3
	LC	4	IB-Mission statement. develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.	PYP	1
	LC	11	embracing multilingualism to enhance intercultural dialogue and global engagement.	PYP	2
	LC	12	International-mindedness:action for positive changes (for example, to promote intercultural understanding)	PYP	3
	LC	48	Support of intercultural understanding, global engagement and multilingualism	PYP	3
	LT	4	Transdisciplinary themes: problems that crossed national boundaries and were interconnected culturally, ecologically, politically, economically and technologically	PYP	1
	LT	15	Reflect on their diversity through language, they move beyond the traditional national, cultural and social boundaries in their daily lives to develop international-mindedness.	PYP	2
	LT	16	Taking action: Address societal problems and to find solutions to environmental, social, economic and cultural challenges	PYP	1
	LT	34	ATL-Thinking skills. Have I been a principled and balanced thinker? (for example, considering ethical, cultural and environmental implications).	PYP	1
Holistic	LT	7	Learning and approaches to teaching, the PYP framework: inspires a coherent educational experience that is broad, balanced and holistic	PYP	3
	LT	30	Teaching holistically means to seamlessly integrate the ATL-skills as a part of the classroom culture and explicitly as part of inquiry.	PYP	3
	LT	68	Effective PYP assessment practice holistically integrates assessment for, of and as learning	PYP	3
	LC	28	A collaborative approach puts students at the centre and aims to ensure a holistic, transdisciplinary and coherent learning experience for them.	PYP	3
	LC	64	Glossary: Holistic: An all-encompassing educational experience that considers students' intellectual, physical, social and emotional learning and development.	PYP	3
Action	LT	5	IB-Learner Profile: Thinkers, We use critical and creative thinking skills to analyse and take responsible action on complex problems.	PYP	2
	LT	5	IB-Learner Profile: Principled, We take responsibility for our actions and their consequences.	PYP	2
	LT	3	Transdisciplinary: knowledge, conceptual understanding, skills, disposition, action	PYP	3
	LT	9	Everyone in the IB community has agency to take action to effect change.	PYP	2
	LT	11	Transdisciplinary themes: How the world works, an inquiry into the natural world and its laws; the interaction between the natural world (physical and biological) and human societies;	PYP	1
	LT	16	International- mindedness goes beyond developing awareness and understanding to fostering engagement and action.	PYP	
	LT	16	Learning through authentic and meaningful action	PYP	2

LT	17	The exhibition offers students the opportunity to put their interests, transdisciplinary thinking, knowledge, conceptual understandings, skills and attributes of the learner profile into action.	PYP	2
LT	21	They can reflect on the significance of their learning to take meaningful action in their community and beyond.	PYP	2
LT	37	Self-Management skills: States of mind, using strategies that manage state of mind by taking responsibility for one's own actions	PYP	3
LT	40	IB-Learner Profile: Inquirers, it prompts students to reflect and take action	PYP	3
LT	40	Represented as the interplay between asking (inquiry), thinking (reflection) and doing (action)	PYP	
LT	42	What does inquiry learning look like? Responsible student-initiated action, emerging throughout inquiry	PYP	
LT	44	Learning Community: provide opportunities for students to take action through their organizations.	PYP	3
LT	45	Theory of inquiry learning: five stages of reflective thinking, placing critical thinking, reflection and action as inseparable in an inquiry environment	PYP	3
LT	49	Key concept: Causation, there are causal relationships at work, and that actions have consequences	PYP	3
LT	49	Key concept: Connection, actions of any individual element affect others	PYP	
LT	49	Key concept: Responsibility, actions they take as a result do make a difference.	PYP	
LT	72	Self-adjusting therefore requires both thought and action and supports students' self-efficacy	PYP	3
LT	75	Approaches to learn: actions are informed and taken based on existing and new understandings of the central idea	PYP	3
LC	1	Learning Community: everyone in the learning community has agency, see themselves as contributors to its strength and success, and take action to affect change	PYP	2
LC	5	IB-Learner Profile: Thinkers, We use critical and creative thinking skills to analyse and take responsible action on complex problems.	PYP	2
LC	5	IB-Learner Profile: Principled, We take responsibility for our actions and their consequences.	PYP	2
LC	11	International-mindedness: An internationally minded learner takes action for positive change	PYP	2
LC	15	Taking appropriate action to support particular groups within the local community.	PYP	3
LC	16	Through teachers' actions, students learn both explicitly and implicitly that differences and diversity are the norms, which creates a feeling of respect, tolerance and acceptance.	PYP	2
LC	26	Student leadership capacity: students identify issues and opportunities, and suggest ideas for action	PYP	1
LC	26	Student leadership capacity: student perspectives for action are honoured	PYP	3
LC	26	Student leadership capacity: students' ideas are supported through action	PYP	3
LC	38	Encourage the process of inquiry, action and reflection	PYP	
LC	45	Time is provided to share, reflect on and celebrate learning, and for students to take action when and where appropriate	PYP	3
LC	63	Glossary: Action: The act of engaging individually and/or collaboratively with local, national and global challenges and opportunities	PYP	1
LC	63	Glossary: Action plan: An organized plan detailing steps for continuous school improvement	PYP	3
LC	63	Glossary: Action research: Inquiry carried out to inform improvement and refinement of learning and teaching	PYP	3
LC	63	Glossary: Advocacy: Advocacy is supporting and committing to action for positive change for oneself and others	PYP	2
LC	63	Glossary: Agency: Agency is a philosophical, sociological and psychological idea that acknowledges humans as active participants in their own lives with the capacity to initiate intentional action	PYP	3
LC	63	Glossary: Agent of change: A person who acts on behalf of themselves or others in connection with action for positive change.	PYP	2

Pluralistic	LC	63	Glossary: Autonomy: The freedom to decide for oneself and pursue a chosen course of action	PYP	3
	LC	63	Glossary: Internationally minded: It involves being engaged with local and global issues and taking action for positive change	PYP	1
	LC	63	Glossary: Principled action: Principled action means taking action that is informed, responsible and ethical	PYP	2
	LP	5	IB-Learner Profile: Thinkers, We use critical and creative thinking skills to analyse and take responsible action on complex problems.	PYP	2
	LP	5	IB-Learner Profile: Principled, We take responsibility for our actions and their consequences.	PYP	2
	LP	2	Efficacy refers to an individual's belief in their "capabilities to organize and execute the courses of action required to produce given attainments"	PYP	3
	LP	3	Teacher listen to students' opinions, wonderings, perspectives and aspirations to extend student thinking and action	PYP	3
	LP	4	Strategies to support agency: Allow time to respond to students' ideas about action.	PYP	
	LP	7	The role of the teacher: Moment- by-moment teacher actions, reactions and interactions with children are key to their cognitive development	PYP	3
	LP	10	Learning space: Opportunities to take action	PYP	3
	LP	22	The IB-Mission statement in action: The learner profile supports students in taking action for positive change	PYP	2
	LP	23	Learner profile supports students in developing international-mindedness and in taking action for positive change	PYP	3
	LP	24	Learner Profile into action: All members of the learning community play an important part in valuing, appreciating, demonstrating and celebrating the learner profile in action.	PYP	
	LP	29	Action is connected to agency, the learner profile and international-mindedness.	PYP	
	LP	29	Action is student-initiated and can be individual and collective.	PYP	
	LP	29	Action is authentic, meaningful and mindful.	PYP	
	LP	29	Action can happen at any time; it can be short or long term, revisited or ongoing.	PYP	3
	LP	29	Action is supported by the learning community.	PYP	3
	LP	29	Demonstrations of action include participation, advocacy, social justice, social entrepreneurship, or lifestyle choices.	PYP	2
	LP	29	Action is a means for students to show that they have linked their learning to real-life issues and opportunities, and that they are developing responsible dispositions and behaviours towards social and physical environments and to the community within and beyond school.	PYP	1
	LP	30	Personal action might be small scale or even private, but it makes a difference in the life of the student and, potentially, the lives of others	PYP	2
	LP	30	Collective action makes a difference in the life of the student, the learning community and, potentially, beyond	PYP	2
	LP	34	Teacher-guided action (with students)	PYP	3
	LP	34	Teacher-initiated shared action (with student s)	PYP	3
	LP	34	Student-initiated and led action (individual/ collaborative amongst students)	PYP	3
	LP	34	Student-initiated shared action (with teachers and learning community)	PYP	3
	LP	36	Learner profile attributes: Balanced, open- minded, I can connect local action to global action and vice versa.	PYP	
	LP	36	Learner profile attributes: Communicator, I take responsible action for a more peaceful and sustainable world.	PYP	1
	LP	36	Learner profile attributes: Principled thinker, I can consider the appropriateness and impact of action taken and reflect on possibilities to improve present and future action.	PYP	2
Pluralistic					

Codes	Document	Page	Content – Scope and Sequence	Curricula	ColorCode
Sustainability	AT	1	IB-Learner-Profile: We learn with enthusiasm and sustain our love of learning throughout life.	PYP	2
	SC	5	Earth and Space, Related topics: Sustainability	PYP	1
	SC	5	Materials and Matter, Related topics: Sustainability	PYP	1
	SC	35	Lines of inquiry: How technology supports/ impacts sustainability?	PYP	2
	SS	5	Resources and the environment, Related topics: Sustainability	PYP	1
	SS	45	Line of inquiry: How technology supports/ impacts sustainability	PYP	2
Environment	AT	3			
	LG	2	Effective language learning and teaching are social acts, dependent on relationships with others, with context, with the environment, with the world, and with the self.	PYP	2
	LG	21	Read and understand familiar print from the immediate environment, for example, signs, advertisements, logos, technology iconography	PYP	2
	MT	23	Explore and describe the paths, regions and boundaries of their immediate environment (inside, outside, above, below) and their position (next to, behind, in front of, up, down)	PYP	3
	PSP	8	Function: An examination of the feelings, beliefs and behaviours affecting our interactions with others and the environment.	PYP	2
	PSP	8	Responsibility: Informed and appropriate choices leading to responsible actions make a difference to our health, well-being, community and the environment.	PYP	1
	PSP	18	an appreciation of the environment and an understanding of, and commitment to, humankind's responsibility as custodians of the Earth for future generations.	PYP	1
	PSP	18	They are aware that their behaviour affects others and identify when their actions have had an impact. Learners interact with, and demonstrate care for, local environments.	PYP	1
	PSP	18	Learners understand that responsible citizenship involves conservation and preservation of the environment.	PYP	1
	PSP	18	They understand that healthy relationships are supported by the development and demonstration of constructive attitudes towards other people and the environment.	PYP	2
	PSP	18	They recognize that people have an interdependent relationship with the environment and other living things and take action to restore and repair when harm has been done.	PYP	1
	PSP	19	Caring for local environments fosters appreciation.	PYP	1
	SC	4	In living things, students inquire into issues related to themselves and their environment, while in Earth and space, students extend their inquiry to include the study of planet Earth and its relationship to the universe.	PYP	1
	SC	5	The study of the characteristics, systems and behaviours of humans and other animals, and of plants; the interactions and relationships between and among them, and with their environment.	PYP	2
	SC	11	the impact of scientific and technological advances on society and on the environment.	PYP	3
	SC	11	observe the features of the local environment that are affected by daily and seasonal cycles.	PYP	3
	SC	11	take responsibility for living things found in his or her environment.	PYP	2
	SC	15	They will be aware of different perspectives and ways of organizing the world, and they will show care and respect for themselves, other living things and the environment.	PYP	1
	SC	18	People interact with, use and value the natural environment in different ways.	PYP	1
	SC	21	Personal choices that can help sustain the environment	PYP	1

	SC	23	The design of buildings and structures is dependent on the environment and available materials.	PYP	3
	SC	23	Explain people's responsibility regarding the use of materials from the environment.	PYP	2
	SC	24	How plants and animals adapt or respond to environmental conditions	PYP	1
	SC	25	identify the evidence that the Earth has changed (for example, land formations in local environment)	PYP	1
	SC	27	They will use their learning in science to plan thoughtful and realistic action in order to improve their welfare and that of other living things and the environment.	PYP	1
	SC	32	How human interaction with the environment can affect the balance of systems	PYP	1
	SS	1	In the PYP, social studies is viewed as the study of people in relation to their past, their present and their future, their environment and their society.	PYP	3
	SS	3	how they interact with their environment; the work they do; and how they organize themselves.	PYP	3
	SS	4	human systems and economic activities, social organization and culture, continuity and change through time, human and natural environments and resources and the environment.	PYP	3
	SS	7	How can we act to prevent further damage to the natural environment?	PYP	1
	SS	15	economic activities and their impact on humankind and the environment.	PYP	1
	SS	16	Students will start to develop an understanding of their relationship with the environment.	PYP	2
	SS	20	People interact with, use and value the natural environment in different ways.	PYP	2
	SS	25	Students will explore the relationship between valuing the environment and protecting it.	PYP	2
	SS	27	Students will explore the relationship between valuing the environment and protecting it.	PYP	2
	SS	34	They will deepen their awareness of how people influence, and are influenced by, places in the environment.	PYP	2
Dimension	AT				
	LG	12	They are aware that language is a vehicle for becoming knowledgeable; for negotiating understanding; and for negotiating the social dimension.	PYP	3
	MT				
	PSP				
	SC				
	SS	3	planning units that build in local, multicultural and global dimensions	PYP	3
Economic	AT				
	LG				
	MT				
	SC	35	economic activities and their impact on humankind and the environment.	PYP	1
	PSP				
	SS	4	Human systems and economic activities	PYP	1
Ecological	AT				
	LG				
	MT				
	PSP				
	SS	-	-	-	-
Social	AT	2	To understand and respond to dance, students need to understand how dance is used in cultural, ritual and social contexts.	PYP	3
	AT	17	discuss music that relates to social issues and/or values	PYP	3

	AT	22	Create a musical composition for expressing their own ideas and feelings on a social issues	PYP	3
	LG	1	it is socially constructed and dependent on the number and nature of our social interactions and relationships.	PYP	3
	LG	19	that it can be a social activity or an individual activity	PYP	3
	MT				
	PSP	5	PSPE provides the models, processes and vocabulary for handling social and personal issues, and ensuring health and well-being.	PYP	2
	SC	27	Students will examine ethical and social issues in science-related contexts and express their responses appropriately	PYP	3
	SS	2	gain conceptual understanding through participating in learning experiences that foster sensitivity, creativity and initiative, including socially responsible action	PYP	3
Cultural	AT	1	IB-Mission statement: The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.	PYP	2
	AT	1	Experiences and engage with historical, social and cultural perspectives.	PYP	2
	LG	4	Making culturally diverse reading material available	PYP	3
	LG	17	Realize that cultural influences affect the way we respond to visual effects and explain how this affects our interpretation.	PYP	3
	MT	8	Perspectives may be individual, group, cultural or disciplinary.	PYP	3
	PSP	2	to understand the cultural significance of physical activities for individuals and communities.	PYP	3
	PSP	5	An understanding of our own beliefs, values, attitudes, experiences and feelings and how they shape us; the impact of cultural influences;	PYP	2
	SC	1	The importance of science in an international curriculum is recognized as universal and transcends the boundaries of gender, cultural, linguistic and national biases.	PYP	3
	SS	3	using multiple sources and presenting multiple perspectives (global, social, cultural and gender)	PXP	3
	SS	3	planning units that build in local, multicultural and global dimensions	PYP	2
Holistic	AT				
	LG				
	MT				
	PSP				
	SC				
	SS				
Action	AT	1	Thinkers: We use critical and creative thinking skills to analyse and take responsible action on complex problems.	PYP	2
	AT	1	Principled: We take responsibility for our actions and their consequences.	PYP	2
	LG	7	reflecting on feelings and actions, and developing empathy.	PYP	3
	LG	8	Causation: actions have consequences.	PYP	2
	LG	9	Responsibility: People make choices based on their understandings, and the actions they take as a result do make a difference.	PYP	3
	MT	2	Learners construct meaning based on their previous experiences and understanding, and by reflecting upon their interactions with objects and ideas	PYP	3
	MT	7	Connection: We live in a world of interacting systems in which the actions of any individual element affect others.	PYP	2

	PSP	3	The emphasis in any unit of work, whether it is within the programme of inquiry or not, should be on seeking a balance between acquisition of essential knowledge and skills, development of conceptual understanding, demonstration of constructive attitudes, and taking responsible action.	PYP	2
	PSP	6	making informed choices and evaluating consequences, and taking action for healthy living now and in the future.	PYP	3
	PSP	8	An examination of the feelings, beliefs and behaviours affecting our interactions with others and the environment.	PYP	3
	SC	2	They should be able to identify the possible causes of an issue, choose a solution, and determine appropriate action to be taken.	PYP	2
	SC	5	the interactions and relationships between and among them, and with their environment.	PYP	2
	SC	11	An inquiry into the natural world and its laws; the interaction between the natural world (physical and biological) and human societies;	PYP	3
	SC	18	Actions that benefit or harm the local environment	PYP	1
	SC	22	Students will consider ethical issues in science-related contexts and use their learning in science to plan thoughtful and realistic action in order to improve their welfare and that of other living things and the environment.	PYP	1
	SS	1	Evidence of student learning will be apparent in their willingness and ability to take action in order to make a difference in the world.	PYP	2
	SS	2	gain conceptual understanding through participating in learning experiences that foster sensitivity, creativity and initiative, including socially responsible action	PYP	3
	SS	3	supporting students to be responsible and to take action in our world today.	PYP	2
	SS	4	people who have shaped the future through their actions.	PYP	2
	SS	42	How human interaction with the environment can affect the balance of systems	PYP	1

APPENDIX B – ONLINE SURVEY



Sustainability

Dear ISU-Community,

I am a student at NHL Stenden University of Applied Sciences, at the International Teacher Education Campus in Meppel, Netherlands. For my bachelor thesis, I am conducting a field study, including a survey and interviews among primary school teachers. The aim of this research is focused on gaining more insights into international primary teachers' perspectives on teaching sustainability. In addition, I want to raise sustainable awareness through education as students will shape our future and the next generations. Therefore, it is important to support our school community by finding out why and how education for sustainability (EfS) can be implemented in an overall context.

The participation is voluntary and the answers will be submitted anonymously. Consequently, you have the right to withdraw your consent or discontinue participation at any time. In order to assure and protect the collected, I need you to sign the consent form before you start with the survey. In case, you have not received the form, I will share the link again:

https://docs.google.com/document/d/1qYC2zAAiWCfBzTefzStpdN75BmUz2WcheBg_aWMLuxk/edit?usp=sharing.

Please send the consent form via email at ann-kathrin.mayer@is-ulm.de or hand it to me personally (Grade 5).

Thanks for participating and enjoy the survey!

All the best,
Ann-Kathrin Mayer

***Required**

Email *

Your email address



1. Which subjects do you teach? *

- ☐ Math
- ☐ UOI
- ☐ Literacy
- ☐ German A
- ☐ German B
- ☐ PSHE
- ☐ Health
- ☐ PE
- ☐ Art
- ☐ Music
- ☐ STEAM
- ☐ IT
- ☐ Other

2. Do you know what 'SDG' stands for? *

- ☐ Yes
- ☐ No
- ☐ I am not sure

3. To what extent are your lessons related to sustainable content (e.g. facts, dimensions, SDG's, etc.) *

0 1 2 3 4 5



No extend (0%)

☐☐☐☐☐☐

Full extend (100%)

4. To what extent are your students involved in independent research, sorting and finding more information about the units of inquiry? *

0

1

2

3

4

5

No extend (0%)

☐☐☐☐☐☐

Full extend (100%)

5. To what extent do you highlight the action taking approach throughout the units of inquiry? *

0

1

2

3

4

5

No extend (0%)

☐☐☐☐☐☐

Full extend (100%)

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Sustainability

*Required

Competencies

In order to empower students with the right balance of teaching approaches, we need to ensure a high quality of teaching to assure a sustainable way of life for all generations. Therefore, I am curious to find out more about your professional and personal perspective on sustainability.

6. Was the topic sustainability part of your personal teacher education course? (University) *

- ☐ Yes
- ☐ No
- ☐ I am not sure

7. Did you have the chance to join a workshop about sustainability? *

- ☐ Yes, the school organised a workshop
- ☐ Yes, the school recommended a workshop
- ☐ Yes, I joined a workshop out of personal interest
- ☐ Yes, I joined a workshop because of other reasons
- ☐ No, I did not join a workshop about sustainability
- ☐ I am not sure



8. Do you know the competency model (ECE) from the United Nations Economic Commission for Europe (2012)? *

- ☐ Yes
- ☐ No
- ☐ I am not sure



9. Do you include the following skills in your lessons? *

	Yes	Partly	No	I am not sure
Understanding the challenges facing society both locally and globally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing practical skills and action competence in relation to education for sustainable development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Development of partnerships and an appreciation of interdependence, pluralism, mutual understanding and peace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Development of one's personal attributes and ability to act with greater autonomy, judgement and personal responsibility in relation to sustainable development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Are you personally interested to learn more about the SDGs?



- ☐ Yes
- ☐ No
- ☐ I am not sure

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Sustainability

*Required

IB-Curricula

Teachers should be role models when it comes to sharing sustainable awareness. Thereby students will realize how powerful knowledge can be as it encompasses multiple aspects such as values, attitudes, expectations and objectives. Therefore, I am curious to investigate the IB-Curricula at the International School of Ulm/Neu-Ulm.

11. How many years have you been working at an IB-School? *

- ☐ 0-3 years
- ☐ 4-7 years
- ☐ 8-11 years
- ☐ 12-15 years
- ☐ 16-19 years
- ☐ 20-23 years
- ☐ more than 23 years
- ☐ I do not know

12. How satisfied or dissatisfied are you with the IB-Curricula framework regarding sustainability? *

- ☐ Very satisfied
- ☐ Satisfied



- ☐ Neutral
- ☐ Dissatisfied
- ☐ Very dissatisfied

13. How satisfied or dissatisfied are you with further support of the IB-Curricula framework regarding sustainability? *

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neutral
- ☐ Dissatisfied
- ☐ Very dissatisfied

14. How satisfied or dissatisfied are you with further resources of the IB-Curricula framework regarding sustainability? *

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neutral
- ☐ Dissatisfied
- ☐ Very dissatisfied



15. Do you agree or disagree with the following? *

	Yes	No	I am not sure
Education should be seen as a key for sustainable issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sustainability should be implemented as an additional subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Should sustainability have an individual inquiry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Should sustainability be linked throughout the units of inquiry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Would you be interested in a further interview about my bachelor thesis? *

- ☐ Yes, please send me mail at ann-kathrin.mayer@is-ulm.de or let me know personally (Grade 5)
- ☐ No

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APPENDIX C – INTERVIEW: SCHEMATIC SCHEDULE

Date: _____

Time: _____

Interview Teacher: _____

Sustainability

1. What does education for sustainability mean to you?

2. *What do you know about sustainability?*

Teaching approaches

1. How are your lessons related to sustainable facts? (globally, locally, nationally) (Q.3, S-Q.2)

3. *How would you prefer to teach about sustainability? (holistic, pluralistic and an action-orientated) (S-Q.1)*

Date: _____

Time: _____

Teachers Competencies

4. Which competencies are necessary to educate about sustainability? (Q.9, S-Q.2)

5. What kind of teaching resources would you appreciate, to implement sustainability within the units of inquiry successfully? (Q.13, S-Q.3)

IB-Curricula

6. What kind of further support would you appreciate from the PYP framework to implement sustainability within the units of inquiry? (Q.13, S-Q.3)

7. Are you using the PYP Resource center to find possible lesson ideas regarding sustainability? If yes, how did you found out about it and how are you using it?

Time: _____

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

APPENDIX D – CONSENT FORM

Study Title: ITEps (International Teacher Education for Primary Schools)

Student Researcher: Ann-Kathrin Mayer, ann-kathrin.mayer@student.nhlstenden.com

I am a student at NHL Stenden University of Applied Sciences, at the International Teacher Education Campus in Meppel, Netherlands. For my bachelor thesis, I am conducting field study, including a survey and interviews among primary school teachers. This consent form provides all important information regarding the research study. The consent form includes aspects of handling possible risks as well as the procedure of analysing, protecting and saving the collected data.

The purpose of this field study is to gain more insights into international primary teachers' perspectives on teaching sustainability. As a future primary school teacher, I would like to know how international primary teachers are supported by the IB-Curricula to educate about the intense topic of environmentalism.

What is the topic of my research paper?

I purposely chose the topic education for sustainability as it is a major topic in our global world. Everyone is certain about the current problems but the act of making a change is missing. Therefore, I am aiming for more awareness through education as students will shape our future and next generations. However, the transition from the theory of the paper into real-world action is difficult and requires a lot of time and effort. Therefore, it is important to support our school community by finding out why and how education for sustainability (Efs) can be implemented in an overall context.

What will be the context of the survey and the interviews?

The purpose of doing an online survey is to receive knowledge about the current circumstances at the school regarding environmental issues and the interrelated sustainable dimensions. Moreover, the survey will provide a general overview of how international primary school teachers are maintained through the IB-System in order to advise suitable methodologies and skills for Efs. In order to keep the survey simple and understandable, I will only use closed-ended questions. Therefore, I can minimize the expenditure of time as the questions can only be answered by selecting from a limited number of options (multiple-choice or rating scale questions). Filling out the survey will not take more than 15-20 minutes.

The purpose of the interviews is to clarify and prove the outcomes of the survey. By conducting semi-structured interviews, I can evaluate perspectives, meanings, and beliefs of each participant. Furthermore, by using semi-structured interviews I have the opportunity to clarify information and to ask extra questions about details that come up throughout the interview that I have not anticipated. This will be helpful in order to identify components that are still unclear or need further explanations. I am planning on having about 15 - 20 minutes interviews with each participant.

What are the possible risks or discomforts?

Individual participation in this study does not involve any physical or emotional risks beyond that of everyday life. Furthermore, is the participation voluntarily to avoid discomforts among the participants.

Any summary of the interview content, or direct quotations from the interview, that are made available through academic publication or other academic outlets will be anonymized so that the participant cannot be identified. In addition, I ensure that other information in the interview that could identify the participant is not revealed. The actual recording will be only kept to transcript the audio for a maximum of one week. Besides, the transcript of the interview will be only analysed by Ann-Kathrin Mayer as research investigator.

Moreover, everyone is free to withdraw from participating immediately from any reason!

What are the possible benefits for me or others?

The study results can be made available to the school and teachers upon completion. Due to the fact, that the research combines a worldwide accredited curriculum called International Baccalaureate with international teachers' perceptions it might be beneficial across other IB-Schools. The aim of this research is to highlight advantages and to advise suggestions of implementing EfS across the IB-curricula and some general possibilities of how to develop a critical awareness about sustainability among the IB-School community.

I believe the final outcomes will help to broaden my knowledge in the field of EfS. Once, I am ready to work as an international primary teacher, I want to use the knowledge about EfS and the suggested teaching approaches to use education as a key to create sustainable consciousness among the school community. Sharing ideas, beliefs and knowledge is always beneficial and helps a school to develop a global and local awareness.

How will we protect the information we collect about the participants, and how will that information be shared?

Throughout the research study the data will be handled confidentially. To give the participant a comfortable feeling about being interviewed and to increase the security of the individuals I will keep the recordings, notes, and answers anonymous. I will keep the collected databases in password protected files on my personal password saved laptop as the laptop will be only used by me. Furthermore, the final results will be used for my bachelor thesis and therefore evaluated by my first and second supervisor from the NHL Stenden University of Applied Sciences. In addition, I need to share the results in my research presentation for university purposes.

What are the individual rights as a research participant?

The **participation is voluntary**. I will share this form with the participants, before I start with the survey and the interviews. The participants have the **right to withdraw their consent or discontinue participation at any time** and will not be penalized in any way for deciding to stop participation. The results of this research study will be presented in a research presentation and in form of a bachelor thesis only for university purposes. The individual privacy will be maintained in all written data resulting from the study.

If there are any questions or concerns about this research study, please contact me!

If you have questions, you are free to ask them now. If you have questions later, you may contact the researcher at:

Name: Ann-Kathrin Mayer

Mail: ann-kathrin.mayer@student.nhlstenden.com

Phone: +49 151 64054604

Supervisor Name: Thomas Gitopoulos

Supervisor mail address: thomas.gitopoulos@nhlstenden.com

Consent

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree that the researcher may carry out the field study, like in the research study described above and will receive a copy of this consent form.

Name (printed)

Signature

Date