Australian Journal of Teacher Education

Volume 47
Issue 5 *Special Issue*

Article 4

2022

Early Childhood Teachers' Perceptions of Environmental Sustainability: A Phenomenographic Investigation

Jane Spiteri

Recommended Citation
Spiteri, J. (2022). Early Childhood Teachers' Perceptions of Environmental Sustainability: A Phenomenographic Investigation. *Australian Journal of Teacher Education, 47*(5).
http://dx.doi.org/10.14221/ajte.2022v47n5.4

Early Childhood Teachers' Perceptions of Environmental Sustainability: A Phenomenographic Investigation

Jane Spiteri
University of Malta, Malta

Abstract: Early childhood teachers' environmental perceptions can influence young children's learning about environmental issues. Yet, to date, there is minimal research focusing on the perceptions of environmental sustainability held by early childhood teachers. This qualitative phenomenographic study collected data via individual semi-structured interviews with five early childhood teachers and one head teacher, in Malta. Preliminary findings revealed that the participants perceived environmental sustainability in terms of environmental concerns; environmental responsibility; and environmental protection. A mismatch between the participants' environmental concerns and their pro-environmental behaviour emerged. The data also show that any environmental activities at school were done so uncritically. These findings hold importance for the reorientation of in-service and pre-service early childhood teacher education programs towards sustainability to ensure that systems thinking around critical environmental issues are introduced in the early years by addressing gaps in knowledge and supporting educators' development at the earliest stage (i.e., pre-service).

Introduction

Unsustainable human behaviour has caused pervasive degradation and destruction to the ecosystems, resulting in substantial damage to living systems on the planet and irreversible losses of biodiversity, pollution, and climate change (Intergovernmental Panel on Climate Change [IPCC], 2022). Such crises will have adverse impacts on planetary systems and humanity and will likely contribute to major humanitarian crises (IPCC, 2022). These challenging times require humans to change the way we live. Considering the limited capacity of the Earth's ecosystem to sustain current lifestyles for long, there is an urgent need for action to empower individuals to act towards safeguarding the environment by adopting sustainable lifestyles (Reid, Dillon, Ardoin, & Ferreira, 2021).

Sustainability entails the maintenance of balance between the interrelated pillars of the economy, ecology, culture, and a socio-political dimension while allowing for future generations to enjoy the Earth's resources that current generations enjoy (UNESCO, 2017, 2019). This paper deals with environmental sustainability because this is the most neglected aspect of sustainability in Malta. Issues around sustainability require individuals to think differently and engage with nature, however, humanity seems to be unable to "think properly about the issues involved" (Bonnett, 2021, p. 10). Sustainability is a term often used in relation to environmental education (EE) and education for sustainable development (ESD), even though both fields have distinct trajectories (Christie & Higgins, 2020). ESD is believed to be key to connecting children to nature, increasing their environmental literacy, and

helping them create a sustainable future (Bonnett, 2021; Reid et al., 2021; United Nations, 2015; UNESCO, 2020a).

In recent times, early childhood education (ECEC)[1] has been proposed as having a key role in teaching children how to live sustainability from an early age (UNESCO, 2020b; United Nations, 2015). This early period of human development is important for the introduction of ECEfS (early childhood education for sustainability) since skills, values, attitudes, and behaviours formed during early childhood tend to have a lifelong impact (OECD, 2018; Pramling Samuelsson et al., 2019). In this context,

> *Education plays a powerful role in promoting equity and empowering children to be active agents in bringing about positive change. Now, more than ever, it is important for ECEfS professionals to come together, understand worldwide concerns and interests, and collaboratively address environmental issues and global restoration (Dean & Elliott, 2022, p. 66)*

ome have argued that issues about environmental sustainability may turn out to be too difficult for young children to understand or the topics too negative (Davis & Elliott, 2009). However, by avoiding discussions of these issues with children, renders both children and issues as invisible, which is particularly problematic given many young children are exposed to a variety of global challenges in their daily lives. Furthermore, such beliefs disempower children in relation to issues that impact their life, now and in the future (Davis & Davis, 2021). In fact, in recent years, emerging research has shown that young children can understand environmental issues and can engage in pro-environmental behaviours (Spiteri, 2021) and encourage others to do the same (Spiteri, 2020). With such growing evidence, the ongoing invisibility of early childhood teachers' perceptions of environmental sustainability is a major concern.

It is widely acknowledged that teachers play a key role in the implementation of ECEfS (Alkaher & Carmi, 2019; Georgiou, Hadjichambis, & Hadjichambi, 2021; Timm & Barth, 2021), and in helping children develop their understanding of, and attitudes towards sustainability (Farias et al., 2018; Murphy et al., 2021). In fact, to date, the evidence is clear – whether teachers implement environmental learning or not in the classroom depends on their environmental knowledge, dispositions, and skills (Green, Medina-Jerez, & Bryant, 2016). Furthermore, how teachers perceive and evaluate sustainability issues influences the way these issues are understood and addressed in the classroom (Alkaher & Carmi, 2019; Engdahl et al., 2021). Yet research suggests that pre-service and in-service teachers are not well-prepared for this role in teacher education programs, in Malta (Spiteri, 2016) and internationally (Butul, 2021; Davis & Davis, 2021; Engdahl, 2021; Meier & Sisk-Hilton, 2017; Nicol, Rae, Murray, Higgins, & Smith, 2019).

Gaps in Current Research

As a result of this renewed interest in the ECEfS field, several studies have been undertaken. Few studies have directly sought the environmental perceptions held by practicing early childhood teachers (Butul, 2021; Meier & Sisk-Hilton, 2017), and the measurement of their pro-environmental behaviour (Monus, 2021). Studies by Butul (2021) and Meier and Sisk-Hilton (2017) showed that teachers held positive perceptions of the natural environment, but they also held misconceptions, and oftentimes teachers were not

[1] Early childhood covers a period of human development from pregnancy through to around age eight (UNESCO, 2017). The term early childhood education (ECEC) refers to education programs aimed at children aged birth and eight years of age (Copple & Bredekamp, 2009; Davis, 2018; Pramling Samuelsson, 2011; UNESCO, 2014).

prepared to provide children with educational experiences in nature that could help them develop an understanding of sustainability.

A recent international study by Dean and Elliott (2022), explored the concerns and interests of 60 educators and researchers, in 19 countries, working in ECEfS by analysing conference documents for the Transnational Dialogues in Early Childhood Education for Sustainability Research (TND), and found that the need to change, the need to ensure equity, and concerns and interests for children's agency were important for ECEfS. According to Engdahl et al. (2021) however, early childhood teachers are not sure what ECEfS is and how it is to be implemented. In their study, in-service Swedish teachers described ECEfS as "business-as-usual" (Engdahl et al., 2021, p. 15) even though they had addressed the field before it became compulsory, in 2019, and they divided the content according to the three dimensions of sustainability. Participants in Engdahl et al.'s study reported that any changes within the school were influenced by top-down decisions and focussed on issues such as plastic and food waste management, and few included transformative change in their ECEfS program. Swedish teachers focussed on biological diversity and traditional content to environmental sustainability and described the environmental dimension of sustainability as taking care of plants in the garden and taking care of animals, with related activities (Engdahl et al., 2021). Engdahl et al. (2021) concluded that while teachers were interested in ECEfS, some lacked knowledge about the field and few teachers understood how planetary systems and human behaviour are interconnected. Consequently, the authors called for professional training to guide teachers. Of interest to the current study is Engdahl et al.'s (2021) definition of environmental sustainability as being not only limited to caring for plants and animals, rather it encompasses waste management, compost, soil, degradation, food, and the ecological cycle (protection and preservation of the environment, and biodiversity loss) as well.

Similar work has been undertaken in pre-service teacher education programs by Nicol et al. (2019), who explored the concept of "super-wicked" (p. 17) problems with pre-service teachers. Super-wicked problems draw attention to global, large-scale sustainability and climate change issues, and to the urgent need to 'take action' (Nicol et al., 2019). Notwithstanding the urgent call for action and the international recognition that teaching about sustainability in early childhood is key to achieving sustainable lifestyles, international research shows that pre-service teacher training programs have been slow to embed sustainability issues and ESD in their degree programs (Nicol et al., 2019). A solution to such problems would be to empower key teachers and other key stakeholders to bring about the much-needed change. Interestingly, in another study with pre-service teachers, Davis and Davis (2021) reported that many initiatives that emerged as a result of the interest and dedication of individual academics and thus, pre-service teacher training programs related to sustainability have been included in the STEM field, yet the field of early childhood pre-service teacher training programs continue to lag further behind in embedding ESD programs. The role of pre-service teacher education courses is not merely to teach about issues related to super-wicked problems. Rather such courses should be part of a systems approach to change (Ferreira & Davis, 2015) aimed at enabling pre-service teachers to question the nature of knowledge and learning (Davis & Davis, 2021; Nicol et al., 2019), specifically demanding "a more radical questioning of the nature of knowledge itself and our attempts to organize and communicate it" (Moran 2010, p. 13).

Although there has been broad research on the implementation of ECEfS by pre-sevice and in-service teachers, much of the research in the field so far indicates a lack of understanding of sustainability issues by teachers as a barrier to the integration of ECEfS across the curriculum (Engdahl et al., 2021; Green & Somerville, 2015). Put another way, early childhood research demonstrates that while early childhood teachers are concerned

about sustainability issues, there is little evidence of how they perceive environmental sustainability, and how they respond in practice. Clearly, teachers need both guidance and training to improve their knowledge, awareness, and strategies for achieving environmental sustainability (Georgiou et al., 2021; Murphy, Mallon, Smith, Kelly, Pitsia, & Martinez Sianz, 2021). For this objective to be achieved, ECEC teachers need to be able to "critically reflect on their own worldviews and ecological identity" (Wilson, 2019, p. 34). Supporting this view, Reid et al. (2021) called for more training for pre-and in-service teachers to provide them with "the credibility and authenticity necessary to render environmental education for children … more effective" (p. 788). Consequently, this calls for a rethinking of both in-service and pre-service teacher education programs. Such programs need to equip teachers with the knowledge, values, and skill to teach young children to become active agents for sustainability (UNESCO, 2019). Therefore, teachers' perceptions of environmental sustainability are worth investigating because these have been shown to make a major contributor to environmental pedagogy and learning (Farias et al., 2018). Furthermore, an understanding of early childhood teachers' perceptions of environmental sustainability may contribute to more effective EE programs (Farias et al., 2018; Yavetz, Goldman, & Pe'er, 2014). This study aims to fill this gap.

The Current Study

This phenomenographic study was designed to provide an in-depth, qualitative understanding of how five early childhood teachers and one head teacher, in Malta, perceive environmental sustainability. The research question that guided this study was as follows: *How do ECEC teachers perceive environmental sustainability?*

Educators' understanding of environmental sustainability is crucial, taking into consideration the importance of the topic for Malta and the key role teachers play in helping current and future generations create change to achieve lifelong sustainability. This novel study adds to the emergent literature around the understanding of environmental sustainability held by early years teachers in Malta. In doing so, this study helps to advance the field of ECEfS by providing insight into the factors related to environmental sustainability that need to be considered when designing pre-service teacher education (ITE) programs to better prepare future teachers for teaching for environmental sustainability, a noticeable gap found among practicing educators participating in the study.

Research Context

This study was conducted in two State schools, in Malta, a small island state, situated in the heart of the Mediterranean Sea, covering approximately 316 km^2 (National Statistics Office [NSO], 2014) and with a population of about 475,701 residents (NSO, 2019). The Ministry for Education [MFED] is responsible for all education provision in Malta (MFED, 2021). In Malta, ECEC is split between childcare settings, offering care for children under three; kindergarten schools, for three to five-year-olds; and, the first two years of primary school, for five to seven-year-olds. ECEC is non-compulsory for children under five years of age.

Several national policies have been published in recent years that aid in the advancement of education provision in Malta, placing special focus on the importance of ECEC for lifelong learning (Ministry of Education and Employment [MEDE], 2012, 2013, 2020). For example, the *National Curriculum Framework* [NCF] (MEDE, 2012) is a

significant document that officially acknowledged ECEC as distinct from primary education for the first time in the history of education in Malta. The NCF (MEDE, 2012) acknowledges children's agency and encourages teachers to provide activities that meet the children's strengths, needs and interests. To achieve this, it proposes five learning outcomes the teachers should enable children to achieve in the early years (children develop a strong sense of identity; children have a positive self-image; children are socially adept; children who are effective communicators; and children who nurture positive attitudes towards learning and become engaged and confident learners). The framework does not prescribe any specific content for children under five years of age. However, while the NCF includes ESD as a cross-curricular theme in the later years of education, it makes no reference to the introduction of ESD in ECEC.

Another important local policy is *The Malta National Lifelong Learning Strategy* (MEDE, 2020) which acknowledges the early years as the foundation for lifelong learning. Therein, strategy 10, raises awareness of the need for greener living as a core component of lifelong learning and recognises the social and environmental pressures (such as overpopulation and overdevelopment) Malta is experiencing. This priority aims to overcome these issues via EE and sustainability literacy. Such measures are addressed in provisions for adult education rather than in relation to ECEC.

Education around environmental sustainability in Malta is not compulsory in ECEC contexts and learning about environmental and sustainability issues is not widely implemented by teachers. In fact, to date, there is no official framework to enable ECEC teachers to introduce ESD in the early years. To make ECEC teachers aware of the need to introduce issues around the environment and environmental sustainability in the early years, the University of Malta has introduced initial teacher education programs in ESD at undergraduate and postgraduate levels.

Despite the absence of explicit reference to themes around environmental sustainability in the early years' framework, some teachers try to incorporate themes related to caring for the natural environment as part of their pedagogy (Spiteri, 2016). Consequently, the present study investigates early childhood teachers' understandings of environmental sustainability.

Method

This study forms part of a larger doctoral research that explored the perceptions of environmental sustainability held by young children and their parents, as well as those held by their teachers and one head teacher (Spiteri, 2016). This article focuses on the findings related to the data about environmental sustainability that emerged from the teachers and the head teacher. Since the aim of this study is to understand how early childhood teachers perceive environmental sustainability, a qualitative phenomenographic research methodology (Bowden & Green, 2005), with an inductive and descriptive design was applied (Miles, Huberman, & Saldana, 2020, 2020).

Indeed, there is a growing body of environmental literature that links phenomenographic approaches with the study of environmental perceptions (Aarnio-Linnanvuori, 2019; Butul, 2021; Evans, Whitehouse, & Hickey, 2012; Loughlan, Reid, & Petocz, 2002; Yavetz et al., 2014). Phenomenographic research utilises explorative procedures to qualitatively describe people's experiences of a phenomenon, collectively and individually (Marton & Ramsden, 1988). The approach gathers empirical data to explore different categories that describe a phenomenon, and the aspects surrounding it, as the phenomenon is experienced and conceptualised by individuals in various ways (Marton,

1994; Lepp & Rinsber, 2002). In doing so, phenomenographic research takes on a subjective stance (Bowden & Green, 2005). From this standpoint, phenomenographic research is based on presenting a relational view of the world (Bowden & Green, 2005), and the different understandings of the phenomenon (Marton, 1981; Marton & Booth, 1997).

In the case of the present study, the focus was the relationship between the participants and the phenomenon under study – their perceptions of environmental sustainability (Bowden & Green, 2005). In phenomenographic research, perceptions are the objective of the study, while assumptions are made about how these were developed. Perception refers to the way an individual experiences or makes sense of the world (Monus, 2021), in this study, participants' perceptions of environmental sustainability. As a result, the researcher was not interested in the phenomenon per se, but rather in the relationship between the participants and their perceptions of environmental sustainability (Bowden & Green, 2005). From a phenomenographic perspective, this study is developmental (Bowden 2000) in that the insights gained from the findings will be used to improve and inform future professional development for teachers.

Participants

Prior to the research, the protocol was approved by education authorities and by the University's ethics committee. A purposive sample (Neuman, 2006) was used, based upon the participants' appropriateness to the purpose of the research study, that is, practicing educators who had an experience of the phenomenon under study via the Eco-School program, in Malta, and their willingness to voluntarily participate in this study. The fulfilment of these criteria was based on the participants' self-assessment. Five early childhood teachers and one head teacher, hereafter referred to collectively as teachers, agreed to be interviewed (see Table 1). Participant consent included publishing rights.

Participant	Sex (F/M)	Role	Qualification	Years of service
Mr D	M	Head teacher	Master's degree in education	9 year 6 months
Ms A	F	Kindergarten 1 teacher	Tertiary certificate in pre-school education	11 years
Ms P	F	Kindergarten 2 teacher	BTEC national diploma in children's care, learning and development	2 years
Ms L	F	Year 1 teacher	B. Educ. (Hons.)	10 years
Ms N	F	Year 2 teacher	B. Educ. (Hons.)	20 years
Ms M	F	Year 2 teacher	B. Educ. (Hons.)	19 years

Table 1. Description of participants.

Data Collection

Following the phenomenographic approach, individual, face-to-face, and semi-structured interviews were the main research methods used (Åkerlind, 2005; Bowden, 2000). These multiple methods helped to frame the different range of perceptions of the environment and environmental sustainability that existed amongst these teachers (Bowden & Green, 2005). In line with the phenomenographic methodology adopted in this study, interviews were directed towards the phenomenon (teachers' perceptions of environmental sustainability); and the interview questions were broad to allow participants to voice their ideas in an unstructured manner (Bruce, Buckingham, Hynd, McMahon, Roggenkamp, & Stoodley, 2004).

The participants were interviewed by the author, at their respective schools. During the interviews, participants answered questions related to their perceptions of environmental sustainability. Sample questions included: What does environmental sustainability mean to you? How did you learn about environmental sustainability? Do you think your own attitudes and behaviours related to environmental sustainability can affect the school culture? Do you address any of these issues we've discussed so far in your classroom/school? Follow-up questions for clarification were asked when necessary. Interviews were audio-recorded and typically lasted approximately 45 minutes. Interviews were then immediately transcribed by the author, after which transcripts were sent to the participants for verification (Åkerlind, 2005; Bowden, 2000; Bowden, 2005). All transcripts were returned to the author, unchanged.

Data Analysis

Data analysis followed guidance from the phenomenographic method, thus data were viewed in their entirety, rather than in isolation (Bowden, 2000). This process resulted in the identification of categories that emerged from the data and represent the variations in the participants' understanding of environmental sustainability (Bowden & Green, 2005).

The phenomenographic consecutive steps of data analysis followed the iterative process described by Åkerlind (2005), Bowden (2000), Bowden and Green (2005) and Walsh (2000). First, all interviews were transcribed verbatim by the author and the consistency was checked against the audio recordings, and corrections were made when necessary. Each transcript was read and re-read several times to help the researcher familiarise herself with the data and to create a reflection on what and how the teachers described their perceptions of environmental sustainability. Next, all transcripts were read several times without prejudice, to obtain an overall impression. During the final reading, summaries of the key categories were noted. The re-reading of transcripts identified concepts in accordance with the aim of the study – early childhood teachers' perceptions of environmental sustainability.

In the next step of the analysis, the researcher identified distinct ways of understanding the teachers' perceptions of the issue under study. This process resulted in a preliminary list of categories. Similarities and differences between data were identified. Similar data were grouped together. From these, a preliminary list of descriptive categories on the data was formed. Therefore, the categories emerged from the data. Thereafter, the relations between the concepts and the preliminary descriptive categories were analysed, during which three established categories emerged as the main results of the teachers' transcripts. The transcripts were read again to check for the accuracy of the initial categories and their descriptions to ensure that each category accurately represented the teachers' perceptions of environmental sustainability. Next, descriptions of the categories reflecting the teachers' perceptions of environmental sustainability were written. Another researcher who was not involved in this study was asked to check the transcript to ensure methodological rigour before any aspect of the analysis was accepted.

Credibility within phenomenographic research involves the relationship between the findings and the definitive description of categories (Bowden & Green, 2005). Specifically, these descriptions do not constitute facts in the outside world but rather the different ways in which the teachers describe their perceptions of environmental sustainability. The credibility of this study was enhanced by using individual and face-to-face interviews as the data collection methods. Interviews provided the opportunity to ask further questions to ensure that the teachers' perceptions of environmental sustainability were understood correctly and

from their perspectives. To ensure validity and reliability, the data summary was shared with participants (Bowden, 2000; Bowden, 2005).

Results

The results of the analysis of the interviews are presented in the three categories that emanated from the data analysis – environmental concerns; environmental responsibility; and environmental protection.

Environmental Concerns

When discussing issues around environmental sustainability, teachers referred to various local and global environmental issues of concern to them. Interestingly, discussions around environmental issues started with a concern for local environmental issues. Issues around waste management and air pollution in Malta were major environmental concerns to all participants. Following local environmental concerns, participants moved on to discuss global environmental issues, such as "global warming". Some discussed global environmental issues of concern, such as "melting ice caps" and as Ms. A explained, "We need to be aware of the effects of waste in our oceans." They used terms like "air pollution", "overfishing", "bird hunting" and "overdevelopment" to express their environmental concerns in Malta. All five of the participants called for bird hunting to become illegal in Malta because they felt that it was unethical to kill so many birds at a time. Mr. D explained that "One day our children will have to travel to see a bird … or nature for that matter."

However, teachers agreed that at times it was difficult for them to deal with certain environmental issues, particularly due to curricular constraints. Ms. L confirmed that the "constraints by curricula and parental pressure to conform to the traditional system make it hard for me to include any teaching about environmental sustainability." She went on to explain that because of these constraints, it was hard for her to deal with environmental issues at school.

Environmental Responsibility

Four teachers perceived environmental sustainability as a way of being responsible for the environment and setting an example for the younger generation. Mr. D felt particularly responsible for "setting a good example to the younger generation on how to protect the environment" and described how at school he often "incorporated activities related to the preservation of nature and natural elements, especially in Malta". Such practices included teaching children about the importance of waste management, water conservation and how to care for the natural environment.

Ms. M described environmental sustainability as being environmentally responsible when it comes to resource use. She described it as "the maintenance of balance of natural capital for as long as possible, otherwise, the Maltese environment is going to be destroyed forever." Similarly, Ms. N described environmental sustainability as "the protection of natural resources and anything made by nature so that we do not deplete it." From an eco-centric perspective, the teachers' responses suggested the need to extend the use of natural resources available on the planet to satisfy human needs now and in the future in a way that such resources are not easily depleted. These two teachers also suggested that adults are

"responsible for ensuring environmental sustainability" everywhere, especially for the benefit of children.

However, they confirmed that at times environmental responsibility was difficult to maintain as it was difficult for them to conform to pro-environmental behaviour in their private life due to personal commitments, and lack of time and financial resources. A similar point was made by Ms. L who talked about the need for adults to care for the environment and its elements for the benefit of humanity, particularly children. Ironically though, she resisted adopting pro-environmental behaviours due to time constraints, claiming that her busy lifestyle conflicted with pro-environmental behaviour. Time constraint was a commonly cited barrier that limited teachers from engaging in pro-environmental behaviour.

Environmental Protection

In this category, teachers proposed actions that would limit the use of non-renewable resources. Mr. D said that he walked to school whenever possible "in order to protect the environment and limit the burning of fossil fuels and air pollution." Ms. N, Ms. A, Ms. M and Ms. P recommended recycling and the use of renewable energy sources going forward. Ms. P insisted that she recycled at home; and at school, encouraged the children in her class to do the same by "setting an example and I show them how I recycle."

Tied to the teachers' perceptions of environmental sustainability was the stated collective need to preserve nature. Most teachers believed that environmental sustainability equated to environmental protection. All participants explained that environmental sustainability entailed first and foremost the "protection of natural resources", "protection of natural elements", "care for nature", "care for God's creation" and "not destroying the environment". As a result, they suggested several ways of preserving natural resources. For example, Ms. A proposed that "People should use only natural resources and natural ingredients in their daily lives." Interestingly, most propositions were made about actions that could be taken in the local environment, such as when Ms. N insisted on the need for the Maltese to "ban bird hunting" and "reduce overfishing." Similarly, Ms. L suggested that "Us Maltese, well, we need to care for the environment and not destroy every piece of land and tree on the island."

Discussion

This phenomenographic study is the first to describe early childhood teachers' perceptions of environmental sustainability, in Malta. Overall, this study provides critical information to assist the development of ECEfS within teacher education programs, in Malta and internationally. The results obtained reveal that teachers perceived environmental sustainability in terms of environmental concerns, environmental responsibility, and environmental protection.

Together, these categories suggest that teachers were aware of the importance of safeguarding the natural environment. Consistent with the literature, teachers spoke about caring for the natural environment as a core concept of environmental sustainability (UNESCO, 2017; 2019). Teachers mostly discussed environmental sustainability by drawing on their local experiences. They spoke about the importance of preserving the natural environment and natural resources, in Malta. More importantly, teachers spoke about environmental issues that impacted them the most and that were the most important to them, with the majority expressing concern over local environmental issues, such as pollution and

bird hunting. They cited waste management and air pollution as the most crucial contributors to local environmental issues. Thus, indicating that the teachers' perceptions were mostly influenced by the local context and the issues therein, as well as by their individual and personal interests.

Oftentimes, teachers presented individualistic perspectives about environmental sustainability and did not take global environmental problems and collective action into consideration when discussing environmental sustainability. Focusing on local environmental sustainability issues could be a precursor to pro-environmental behaviour (Spiteri, Higgins, & Nicol, 2022). Nevertheless, by focusing on local issues, teachers may have lacked a systemic thinking approach that is required to deal with these issues effectively (Sustainable Development Solution Network [SDSN], 2014).

The findings hint at the need for early childhood teachers' perceptions concerning environmental sustainability to be expanded and more knowledge about global and systemic concerns introduced. Teachers must be made aware of global environmental issues that are a threat to all life forms on the planet, such as climate change. Specifically, they need to become aware of how individual behaviour could have an impact on the global environment. While it is encouraging that these teachers were aware of local environmental issues, and tried to act responsibly, only Ms. A and Mr. D mentioned global environmental sustainability issues as major issues of concern to them. However, when asked to talk more about these issues they seemed to hold a limited understanding of these concepts. Aligned with findings from similar research (Ghosn-Chelala & Akar, 2021; Georgiou et al., 2021; Timm & Barth, 2021), in the current study, the context and local environmental issues of Malta influenced the teachers' perceptions. In contrast, Farias et al. (2018) argued that the context in which the schools were situated did not influence Brazilian teachers' environmental perceptions, even though these schools were situated in environmentally degraded areas.

In this study, most teachers considered adults, and themselves, to be personally responsible to ensure environmental sustainability. Teachers expressed awareness of personal responsibility to positively influence and protect the environment, for example by reducing consumption of non-renewable energy sources (e.g., fossil fuels) and recycling (e.g., paper) whenever possible. Such awareness concerning environmental sustainability issues is important because it represents some personal commitment toward sustainability. Nevertheless, participants admitted to not always adopting pro-environmental behaviours, in their personal lives and/or at school. Reasons for not adopting pro-environmental behaviour at school included curricular constraints and parental pressure to conform to traditional modes of teaching. These constraints appeared to overwhelm teachers and acted as barriers to the implementation of environmental learning in the ECEC classroom. In Engdahl et al.'s (2021) study, teachers in England too struggled to meet the curricular demands. Therefore, teachers need assistance in translating knowledge about sustainability into practice.

A comparison of the findings with other studies confirms that certain constraints act as barriers to adopting pro-environmental behaviour. For example, in Ghosn-Chelala and Akar's (2021) study, teachers in Lebanon mentioned curriculum constraints, top-down decision-making, time constraints, and pressure from parents and society as major barriers to implementing environmental activities. Timm and Barth (2021) found that German teachers too reported structural obstacles, such as bureaucratic burdens at school and curricula, and personal obstacles, such as personal life situation and background as barriers to engaging in pro-environmental behaviour. In this Maltese study, reasons for not adopting pro-environmental behaviours in personal life included personal commitments, time constraints, and financial issues. In fact, Ms. L noted how these commitments shaped how she behaved, thought, and engaged with environmental and sustainability issues, indicating that socio-economic and demographic characteristics may influence environmental behaviour. Such

behaviour reflects the sociocultural norms around environmental sustainability issues in Maltese society, where most people are aware of the environmental degradation happening in Malta, yet many are unwilling to take personal action to mitigate these issues.

Interestingly, when asked to discuss the broader issues about sustainability, such as its political aspect, none of the participants wanted to discuss this aspect. In the same manner, Dunlop et al. (2021) too reported that teachers in England refused to discuss the political dimension of sustainability. Dunlop et al. (2021) argued that reasons for not discussing the political aspect included fearing the consequences of taking such risks in the classroom, including inflammatory discourse, the risk of losing classroom control, the risk of sounding insensitive to individuals holding different views, and the way they would be viewed by the wider community, including parents and others in authority. Perhaps akin to Dunlop et al.'s (2021) study, teachers in the current study feared the implications such discussions could have on their employment and prospects, even though anonymity and confidentiality were guaranteed within the research process. In contrast to Dunlop et al.'s study, the current study was conducted on a small island, within a tight-knit community, which easily enables the identification of individuals.

Implications for Policy and Practice

This phenomenographic investigation revealed that Maltese teachers were at the beginning of a journey towards environmental sustainability, which is admirable given the small community and its colonial history. This is an interesting finding with strong implications for policy and practice, especially when considering the recent research demonstrating that teachers are more likely to pass on knowledge to children under their care by making pedagogical changes to incorporate important issues in their pedagogy (Alkaher & Carmi, 2019; Engdahl et al., 2021; Farias et al., 2018; Guerriero, 2017). Strong evidence also suggests that a lack of understanding of sustainability issues could hinder teachers from implementing ECEfS content in the classroom (Engdahl et al., 2021; Green & Somerville, 2015) and teachers may inadvertently discourage children from becoming social agents of change for sustainability, thereby further negating the positive impact of education for sustainability.

Crucially, this paper identifies ways in which policy could play a role in building teachers' capacity to include ECEfS in Malta. The findings of this study highlight the need for more up-to-date policies related to ECEfS, starting with the curriculum. The local needs are to be reflected in the curriculum (Dunlop et al., 2021). While in Malta the curriculum needs reconfiguring to include environmental sustainability in ECEC, such reconsideration is unlikely given how the system currently functions. New directions in curriculum policy that would enable the implementation of ECEfS in Malta may include environmental sustainability issues related to local and global environmental issues, where teachers have some freedom to teach about topics which fit with the times as well as with the educational philosophy that encourages children to learn how to live their lives more sustainably. The challenge here would be that such a change is likely to be seen as new, and therefore to be perceived as difficult to implement. While teachers have little control over what goes into the curriculum, they can determine what is taught in the classroom (Dunlop et al., 2021). In this case, an achievable goal would be to encourage teachers to view the curriculum differently by giving them knowledge and confidence to view the overlaps between ECEfS and the curriculum.

Since teachers are key actors in such efforts, teacher training programs play a key role in enhancing teachers' environmental perceptions and their pedagogy (Georgiou et al., 2021;

Ghosn-Chelala & Akar, 2021; Murphy et al., 2021). Approaches to teaching and learning within pre-service teacher education programs need to address the barriers and constraints to adopting pro-environmental behaviours, encouraging all teachers to act as role models for young children. For this to be achieved, education must prepare teachers for the environmental sustainability challenges ahead. This requires the introduction of effective teacher education programs for both in-service and pre-service teachers, both as strategy and as content, that focus on both individual and collective actions towards the development of sustainability competencies by teachers and children alike (Murphy et al., 2021). Teachers must be prepared to learn how to handle new and uncertain situations that might arise in the classroom because of the global environmental crisis. This could be achieved through place-based education and community education programs in which teachers learn about the impacts of individual behaviour on local and global scales, where teachers are actively engaged in developing a relationship with nature while acquiring the knowledge, values and skills needed to effectively promote environmental learning in the early years. Nevertheless, it is worth noting that while these educational approaches offer rich learning opportunities, alone they cannot achieve the goals of ECEfS. Consequently, a more integrated and holistic approach to implementing ECEfS is needed.

The University of Malta offers a study unit about environmental education in its pre-service teacher training programs, as part of the Bachelor of Early Childhood Education course, however, further strategic attention is required. There are limitations to including stand-alone study units (Nicol et al., 2019). In this regard, Nicol et al. (2019) and Davis and Davis (2021) suggested that both professional development and the students' recognition of the need to be an activist and who is willing to 'take action' are required for the successful implementation of ECEfS. If pre-service teacher training programs are to bring about the much-needed systematic change, such programs in Malta, and internationally, will require additional support from education authorities. Without such support, the approach described by Nicol et al. (2019) and Davis and Davis (2021) will not prevail.

Despite these recognized efforts and calls for systemic change (Davis & Davis, 2021; Nicol et al., 2019), it appears that training programs for pre-and in-service teachers are still included as 'add on' rather than being fully embedded within the teacher training programs in different countries around the world, and particularly in Malta. Given the importance of ensuring that teachers are equipped to support young children to become environmentally literate and combat unsustainable lifestyles, it is almost unthinkable in the current global crisis that both in-service and pre-service teacher education programs would not draw attention to issues around environmental sustainability and focus on the need to act.

The Maltese system draws its curricula based on lessons learned from other contexts. Morel, Coburn, Catterson, and Higgs (2019) warn that curricular initiatives that focus on adaptation and replication of strategies may be counterproductive. Furthermore, Reid et al. (2021) argued that there is a danger with approaches that measure achievement against a benchmark rather than providing effective and democratic opportunities for changes in local practices. While Morel et al. (2019) and Reid et al. (2021) did not refer to the Maltese education system, these arguments nevertheless apply. The Maltese education system is also based on a benchmark system, where children (as early as primary education) are assessed against a national benchmark system. This is a system that is informed by a mechanistic perspective that largely ignores environmental sustainability and is based on the needs of the local industry, an idea that deviates from the principles of ESD (Pace, 2007). It, therefore, deviates from UNESCO's (2021) vision for education:

> *We are confident that education is a powerful enabler of positive change of mindsets and worldviews and that it can support the integration of all dimensions of sustainable development, of economy, society and the*

> *environment, ensuring that development trajectories are not exclusively orientated towards economic growth to the detriment of the planet, but towards the well-being of all within planetary boundaries. (paragraph 3)*

Put another way, and in keeping with the recommendations made in this section of the paper, Maltese education requires a radical shift to reach its goals to transform education and Maltese society towards sustainability.

Conclusion

As a first, this study provides some initial insights into early childhood teachers' perceptions of environmental sustainability, in Malta. The analysis of the data suggests that Maltese teachers have some understanding of these issues and they expressed willingness to act pro-environmentally, but they also experienced constraints. Most teachers equated environmental sustainability with the preservation of nature by tackling environmental issues more effectively. More importantly, they expressed a sense of responsibility in addressing environmental issues, but they also experienced a conflict between their sense of responsibility and their commitments. In such instances, lack of time, pressure from parents, and curricular constraints acted as challenges that led to environmental concerns being considered secondary.

Many questions remain unanswered. In the absence of detailed guidance about ECEfS, what should be taught within in-service and pre-service teacher education programs? Clearly, teachers' perceptions of environmental sustainability influence their pedagogies in the classroom. Knowing how teachers perceive environmental sustainability is one way through which administrators and policymakers can design pre-service and in-service teacher education programs aimed at enhancing teachers' understanding of environmental sustainability. Knowing why and how ECEfS can be taught in the early years' classroom is crucial, and providing teachers with the knowledge and confidence to include ECEfS across the curriculum is needed. These results transmit a strong message to stakeholders who are collectively responsible for ensuring that young children are offered opportunities to learn how to deal with environmental issues in an uncertain future.

References

Aarnio-Linnanvuori, E. (2019). How do teachers perceive environmental responsibility? *Environmental Education Research*, *25*(1), 46–61. https://doi.org/10.1080/13504622.2018.1506910

Åkerlind, G. (2005). Learning about phenomenography: Interviewing, data analysis and the qualitative research paradigm. In J.A. Bowden, & P. Green (Eds.). *Doing developmental phenomenology* (pp. 63–73). Melbourne: RMIT University Press.

Alkaher, I. & Carmi, N. (2019). Is population growth and environmental problem? Teachers' perceptions and attitudes towards including it in their teaching. *Sustainability*, *11*, 1994. https://doi.org/10.3390/su11071994

Bonnett, M. (2021). Environmental consciousness, nature, and the philosophy of education: Some key themes. *Environmental Education Research*, *Ahead-of-Print*, 1–11. https://doi.org/10.1080/13504622.2021.1951174

Bowden, J. (2000). The nature of phenomenographic research." In J. Bowden, & E. Walsh (Eds.). *Phenomenography*. Melbourne: RMIT Publishing.

Bowden, J. (2005). Reflections on the phenomenographic team research process. In J.A, Bowden, & P. Green (2005). (Eds.). *Doing developmental phenomenography* (p.11–31). Melbourne: RMIT University Press. https://doi.org/10.5040/9781472972835.0277a

Bowden, J.A., & Green, P. (2005). (Eds.). *Doing developmental phenomenography*. Melbourne: RMIT University Press.

Bruce, C., Buckingham, L., Hynd, J., McMahon, C., Roggenkamp, M., & Stoodley, I. (2004). Ways of experiencing the act of learning to program: A phenomenographic study of introductory programming students at university. *Journal of Information Technology Education*, *3*, 143–160. https://doi.org/10.28945/294

Butul, A. (2021). Metaphorical perceptions of preschool teachers on the concept of nature. *International Journal of Social and Education Sciences*, *3*(2), 237–251. https://doi.org/10.46328/ijonses.142

Christie, B., & Higgins, P. (2020). *The educational outcomes of learning for sustainability: A brief review of literature*. Edinburgh: The University of Edinburgh.

Copple, C., & Bredekamp, S. (2009). Developmentally appropriate practice in early childhood programs serving children from birth through age 8. (3rd ed.). Washington, DC: NAEYC.

Davis, J.M. (2018). (Ed.) *Young children and the environment. Early education for sustainability* (2nd ed.). Cambridge: Cambridge Univesity Press.

Davis, J., & Davis, J. (2021). Probing the gap between policy and practice in initial early childhood teacher education in Australia in relation to education for sustainability. *Asia-Pacific Journal of Teacher Education*, *49*(5), 550–565. https://doi-org.ejournals.um.edu.mt/10.1080/1359866X.2021.1880545

Dean, S.N., & Elliott, S. (2022). Urgency, equity, and agency: An assemblage of global concerns and interests in early childhood education for sustainability. *International Journal of Early Childhood Environmental Education*, *9*(2), 56 – 68. https://cdn.naaee.org/sites/default/files/eepro/resource/files/ijecee_92_spring_2022.pdf

Dunlop, L., Atkinson, L., Stubbs, J.E., & Turkenburg-van Diepen, M. (2021). The role of schools and teachers in nurturing and responding to climate crisis activism. *Children's Geographies*, *19*(3), 291 – 229. https://doi.org/10.1080/14733285.2020.1828827

Engdahl, I., Pramling Samuelsson, I., Ärlemalm-Hagsér, E. (2021). Swedish teachers in the process of implementing education for sustainability in early childhood education. New Ideas in Child and Educational Psychology, 1(1), 3–23. https://nicepj.ru/upload/iblock/45a/ulru8sekgn08dylm0hh7h7eq0c4hmfbk/01_NICEP_1_2021.pdf

Evans, N., Whitehouse, H., & Hickey, R. (2012). Pre-service teachers' conceptions of education for sustainability. *Australian Journal of Teacher Education*, *37*(7), 1–12. http://dx.doi.org/10.14221/ajte.2012v37n7.3

Farias, L.A., Silva, J.A., Colagrande, E.A., & Arroio, A. (2018). Opposite shores: A case study of environmental perception and social representations of public school teachers in Brazil. *International Research in Geographical and Environmental Education*, *27*(1), 43–55. http://dx.doi.org/10.1080/10382046.2017.1285136

Ferreira, J., & Davis, J. (2015). Using research and a systems approach to mainstream change in early childhood education for sustainability. In J. Davis (Ed.), *Young children and the environment: Early education for sustainability (*2nd ed., pp. 301–316). Cambridge University Press.

Georgiou, Y., Hadjichambis, A.C., & Hadjichambi, D. (2021). Teachers' perceptions on environmental citizenship: A systematic review of the literature. *Sustainability*, *13*, 2622, 1–29. https://doi.org/10.3390/su13052622

Ghosn-Chelala, M., & Akar, B. (2021). Citizenship education for environmental sustainability in Lebanon: public school teachers' understandings and approaches. *Environmental Education Research*, *27*(3), 366–381. https://doi.org/10.1080/13504622.2021.1879024

Green, C., Medina-Jerez, W., & Bryant, C. (2016). Cultivating environmental citizenship in teacher education. *Teacher Education*, *27*, 117–135. https://doi.org/10.1080/10476210.2015.1043121

Green, M., & Somerville, M. (2015). Sustainability education: researching practice in primary schools. *Environmental Education Research*, 21(6), 832–845. https://doi.org/10.1080/13504622.2014.923382

Guerriero, S. (2017). Teachers' pedagogical knowledge: What it is and how it functions. In S. Guerriero (ed.). Pedagogical knowledge and the changing nature of the teaching profession. Paris: OECD Publishing. https://doi.org/10.1787/9789264270695-6-en

Intergovernmental Panel on Climate Change (IPCC). (2022). Climate change 2022. Impacts, adaptation and vulnerability. Summary for policymakers. Switzerland: Intergovernmental Panel on Climate Change. Retrieved from: https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf

Lepp, M., & Ringsberg, K.C. (2002). Phenomenography: A qualitative research approach. In R.L., Hallberg, & M. Lund, (Eds). *Qualitative methods in public health research: Theoretical foundations and practical examples*. Sweden: Studentlitteratur.

Loughlan, T., Reid, A., & Petocz, P. (2002). Young People's Conceptions of Environment: A phenomenographic analysis. *Environmental Education Research*, *8*(2), 187–197. https://doi.org/10.1080/13504620220128248

Marton, F. (1981). Phenomenography - describing conceptions of the world around us. *Instructional Science*, *10*, 177–200. https://doi.org/10.1007/BF00132516

Marton, F. (1994). On the structures of awareness. In J.A., Bowden, & E. Walsh, (Eds.). *Phenomenongraphic research: Variations in methods.* Melbourne, Australia: Office of the Director EQARD, Royal Melbourne Institute of Technology.

Marton, F., & Booth, S. (1997). *Learning and awareness*. Mahwah, NJ: Lawrence Erlbaum Associates.

Marton, F., & Ramsden, P. (1988). "What does it take to improve learning?" In P. Ramsden (ed.). *Improving learning: New perspectives*. London: Kogan Page.

Meier, D., & Sisk-Hilton, S. (2017). Nature and environmental education in early childhood. *The New Educator*, *13*(3), 191–194. https://doi.org/10.1080/1547688X.2017.1354646

Miles, M.B., Huberman, A.M., & Saldana, J. (2020). *Qualitative data analysis: A methods sourcebook* (4th ed.). California: Sage Publicasions, Inc.

Ministry for Education. (MFED). (2021). *Child care centres*. Retrieved from: https://fes.gov.mt/en/Pages/Centres/centres_child_care.aspx.

Ministry of Education and Employment (MEDE). (2012). *A National Curriculum Framework for All*. Malta: Salesian Press.

Ministry of Education and Employment (MEDE). (2013). *Early childhood education & care in Malta: The way forward*. Retrieved from: https://education.gov.mt/en/documents/public%20consultations/white%20paper.pdf

Ministry of Education and Employment (MEDE). (2020). *Malta national lifelong learning strategy 2020*. Retrieved from: https://education.gov.mt/en/Documents/Malta%20National%20Lifelong%20Learning%20Strategy%202020.pdfMoran, J. (2010). *lnterdisciplinarity: The new critical idiom - 2nd edition.* Oxon: Routledge.

Monus, F. (2021). Environmental perceptions and pro-environmental behaviour comparing different measuring approaches. *Environmental Education Research*, *27*(1), 132–156. https://doi.org/10.1080/13504622.2020.1842332

Morel, R.P., Coburn, C., Catterson, A.K., & Higgs, J. (2019). The Multiple Meanings of Scale: Implications for Researchers and Practitioners. *Educational Researcher*, *48*(6), 369–377. https://doi.org/10.3102/0013189X19860531

Murphy, C., Mallon, B., Smith, G., Kelly, O., Pitsia, V., & Martinez Sainz, G. (2021). The influence of a teachers' professional development programme on primary school pupils' understanding of and attitudes towards sustainability. *Environmental Education Research*, *27*(7), 1011–1036. https://doi-org/10.1080/13504622.2021.1889470

Neuman, W. (2006). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Boston: Pearson/Allyn and Bacon.

Nicol, R., Rae, A., Murray, R., Higgins, P., & Smith, H. (2019). How can initial teacher education tackle "super-wicked" problems? *Scottish Educational Review*, *52*(1), 17–29. https://doi.org/10.1163/27730840-05101004

NSO – Malta. (2014). *National summary data page*. Retrieved from: http://www.nso.gov.mt/statdoc/document_file.aspx?id=3998

NSO – Malta. (2019). *Key figures for Malta – Visuals and words – 2019 edition*. Retrieved from: https://nso.gov.mt/en/nso/Media/Salient-Points-ofPublications/Pages/Key-Figures-for-Malta—2019.aspx

OECD. (2018). *Engaging Young Children: Lessons from Research about Quality in Early Childhood Education and Care, Starting Strong*. Paris: OECD Publishing. Retrieved from: https://doi.org/10.1787/9789264085145-en

Pace, P. (2007). Empowering citizens through education for sustainable development. In P. G. Xuereb (Ed.), *Business ethics and religious values in the European Union and Malta – for a moral level playing field* (pp. 209–220). The European Documentation and Research Centre, University of Malta: Civil Society Project Report 2007.

Pramling Samuelsson, I., & Kaga, Y. (Eds.). (2008). *The contribution of early childhood education to a sustainable society*. Paris: UNESCO. Retrieved from: http://unesdoc.unesco.org/images/0015/001593/159355e.pdf

Pramling Samuelsson, I., Li, M., Hu, A. (2019). Early childhood education for sustainability: A driver for quality. *ECNU Review of Education*, *2*(4) 369–373. https://doi.org/10.1177/2096531119893478

Reid, A., Dillon, J., Ardoin, N., & Ferreira, J. (2021). Scientists' warnings and the need to reimagine, recreate, and restore environmental education. *Environmental Education Research*, *27*(6), 783–795. https://doi.org/10.1080/13504622.2021.1937577

Spiteri, J. (2016). *Young children's perceptions of environmental sustainability: A Maltese perspective*. Unpublished PhD thesis. Edinburgh: The University of Edinburgh.

Spiteri, J. (2020). Too young to know? A multiple case study of child-to-parent intergenerational learning in relation to environmental sustainability. *Journal of Education for Sustainable Development, 14*(1), 61–77. https://doi.org/10.1177/0973408220934649

Spiteri, J. (2021). Can you hear me? Young children's understanding of environmental issues. *International Studies in Sociology of Education*, *30*(1–2), 191–213. https://doi.org/10.1080/09620214.2020.1859401

Spiteri, J., Higgins, P., & Nicol, R. (2022). It's like a fruit on a tree: Young Maltese children's understanding of the environment. *Early Child Development and Care*. https://doi.org/10.1080/03004430.2020.1850444

Sustainable Development Solution Network (SDSN). (2014). *Young children as the basis for sustainable development*. Issue Brief, 18 February 2014, prepared by the Thematic Group on Early Childhood Development, Education, and Transition to Work. Retrieved from: http://unsdsn.org/wp-content/uploads/2014/02/ECD-Brief1.pdf

Timm, J.M., & Barth, M. (2021). Making education for sustainable development happen in elementary schools: The role of teachers. *Environmental Education Research*, *27*(1), 50–66. https://doi-org/10.1080/13504622.2020.1813256

UNESCO. (2017). *Early childhood care and education*. UNESCO website. Retrieved from: http://en.unesco.org/themes/early-childhood-care-and-education

UNESCO. (2019). *Educational content up close: Examining the learning dimensions of education for sustainable development and global citizenship education*. Paris: UNESCO. Retrieved from: https://unesdoc.unesco.org/ark:/48223/pf0000372327?posInSet¼4&queryId¼2f582ece-b364-47a0-9ca1-0349f403127e

UNESCO. (2020a). *International day of education*. UNESCO website. Retrieved from: https://en.unesco.org/commemorations/educationday

UNESCO. (2020b). *Education for sustainable development: A roadmap*. Paris: UNESCO. Retrieved from: https://www.gcedclearinghouse.org/sites/default/files/resources/200782eng.pdf

UNESCO. (2021). *Learn for Our Planet. Act for Responsibility. Berlin Declaration on Education for Sustainable Development*. Paris: UNESCO. Retrieved from: https://en.unesco.org/sites/default/files/esdfor2030-berlin-declaration-en.pdf

United Nations. (2015). *Transforming our world: The 2030 Agenda for sustainable development*. A/RES/70/1. Geneva: United Nations. Retrieved from: https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf

Walsh, E. (2000). Phenomenographic analysis of interview transcripts. In J. Bowden, & E. Walsh (Eds.). *Phenomenography* (pp. 19–33). Melbourne: RMIT Publishing.

Wilson, R. (2019). What is nature? *International Journal of Early Childhood Environmental Education*, 7(1), 26–39.

Yavetz, B., Goldman, D., & Pe'er, S. (2014). How do preservice teachers perceive 'environment' and its relevance to their area of teaching? *Environmental Education Research*, *20*(3), 354–317. https://doi.org/10.1080/13504622.2013.803038