

Novice Teachers' Beliefs and Knowledge about Education for Sustainable Development

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Abstract. Incorporating education for sustainable development (ESD) into the curriculum is one of the main priorities of education policy in Latvia and internationally. Implementation of ESD relies greatly on individual teachers' beliefs, enthusiasm, theoretical knowledge and practical expertise. It is widely recognized that teachers' beliefs influence their decisions about the curriculum, pedagogy and assessment. While teachers' beliefs and general pedagogical knowledge receive considerable attention in teacher education research worldwide, novice teachers' beliefs and knowledge regarding sustainability and ESD are not widely discussed despite the widespread assumption that teacher's preparedness and intention to teach ESD tend to be motivated by the beliefs and knowledge a teacher holds. Some education researchers argue that novice teachers tend to have limited understanding of sustainability and ESD. The aim of the research described in this article was to reveal the range of ways in which a sample of 32 volunteer novice teachers in Latvia perceive, understand and experience ESD, as well as how ESD relates to their professional practice. A phenomenographic approach is applied in this study. Data collection methods include semi-structured interviews, written questionnaires, and focus group discussions. The study revealed a range of ways in which novice teachers conceptualize sustainability and ESD. The insights from this research might serve to inform teaching and learning practices in the undergraduate and postgraduate teaching courses and to prepare teachers more adequately to implement ESD.

Keywords: novice teachers, education for sustainable development (ESD), teachers' beliefs, knowledge, understanding

Pradedančiųjų dirbti mokytojų žinios ir įsitikinimai apie švietimą darniam vystymuisi

Santrauka. Švietimo darniam vystymuisi (ŠDV) tikslų įtraukimas į ugdymo turinį yra vienas pagrindinių tarptautinių ir Latvijos švietimo politikos prioritetų. Vis dėlto ŠDV įgyvendinimas dažnai priklauso nuo mokytojų turimų teorinių žinių bei praktinės ekspertizės, nuo jų įsitikinimų ir entuziazmo. Visuotinai pripažįstama, kad mokytojų įsitikinimai turi įtakos jų sprendimams pasirinkti ugdymo turinį, ugdomuosius procesus ir vertinimą. Nors pedago-

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gų ugdyme mokytojų turimos pedagoginės žinios ir įsitikinimai sulaukia daug dėmesio ir teigiama, kad mokytojų pasirengimas ir ketinimai integruoti ŠDV priklauso nuo jų įsitikinimų ir turimų žinių, pradedančiųjų dirbti mokytojų žinios ir nuomonė apie darnų vystymąsi ir ŠDV yra veik nenagrinėti. Dalis tyrėjų teigia, kad pradedantys dirbti mokytojai turi ribotą supratimą apie darnumą ir ŠDV. Šis straipsnis pristato fenomenologinį tyrimą, atliktą su 32 Latvijoje pradedančiais dirbti mokytojais, kuriuo parodoma, kaip šie mokytojai supranta, priima bei patiria ŠDV ir kaip ŠDV yra susijęs su jų profesine praktika. Empirinio tyrimo duomenys surinkti pasirinkus pusiau struktūruotą interviu, klausimynų ir fokus grupių diskusijų metodus. Atliktas tyrimas parodė, kad pradedantys dirbti mokytojai skirtingai konceptualizuoja darnumą ir ŠDV. Šio tyrimo išvalgos gali padėti geriau suprasti pirmosios ir antrosios pakopos pedagogų rengimo programose esančias mokymo ir mokymosi praktikas bei gali paskatinti mokytojus tinkamiau įgyvendinti ŠDV.

Pagrindiniai žodžiai: pradedantys dirbti mokytojai, švietimas darniam vystymuisi (ŠDV), mokytojų įsitikinimai, žinios, supratimas.

Introduction

Education for sustainable development (ESD) has become in recent years the focus of local, state and international education initiatives and reform. Today, education for sustainable development is increasingly understood as an integral part of quality education and lifelong learning, as well as a form of action-oriented transformative and competence-based education (Rieckmann, 2018). The pressure for teachers to embed education for sustainable development into the curriculum is increasing internationally (Evans, Whitehouse, & Gooch, 2012; Rieckmann, 2018). At this point, understanding how teachers, teacher educators, and school leaders perceive and understand sustainable development and ESD is of great importance (Kilinc & Aydin, 2013).

According to the forthcoming general education reform in Latvia, teachers in all subjects soon will have to incorporate a holistic competency-based approach into their teaching practices and teach according to the principles of ESD. At the same time, over the past years, a large amount of studies has clearly demonstrated that teachers from different subjects perceive and understand sustainability and ESD differently (Borg, Gericke, Höglund, 2012; Boon, 2011; Uitto & Saloranta, 2017; Badjanova, Iliško, & Drelinga, 2014; Evans, Whitehouse, & Hickey, 2012).

To date, few researchers have investigated novice teachers' beliefs and knowledge of ESD. Those who have addressed this issue in their works argue that such investigations are important in that they might provide significant findings to inform teacher education policy and practice (Evans et al., 2012; Boon, 2011; Uitto & Saloranta, 2017; Lamanauskas, & Augienė, 2017). That is especially relevant and important in the context of the ongoing education reform in Latvia, particularly taking into account the existing shortages of young, enthusiastic, and highly professional school teachers capable of reshaping and reconstructing education for sustainable future. Teachers are now required to develop a wide range of sustainability competencies, including knowledge (related to both content and methodology), skills, attitudes, values, motivation, and sustainability philosophy. However, in addition to general sustainability competencies, they also need ESD competencies, which can be described as a teacher's capacity to help students develop sustainability competencies through a range of innovative teaching

and learning practices (Rieckmann, 2018; Uitto & Saloranta, 2017). Researchers claim that it is important to pay attention to teachers' awareness of their ESD competences in order to encourage and empower them to plan and implement discipline-based and interdisciplinary ESD in their teaching practice (Uitto & Saloranta, 2017).

Although it is widely recognized that "teacher's role is of paramount importance to supporting sustainability education and sustainable development" (Boon, 2011), a range of recent studies have demonstrated that novice teachers are likely to graduate with minimal exposure to and understanding of sustainability-related concepts (Boon, 2011; Birdsall, 2014; Burmeister & Eilks, 2013; Hickey, Whitehouse, & Evans, 2010), and a limited capacity and confidence to implement education for sustainability because they do not receive sufficient pre-service training and practical experience in relation to ESD (Spiropoulou, Antonakaki, Kontaxaki & Bouras, 2007; Uitto & Saloranta, 2017; Burmeister & Eilks, 2013). For example, in their study, involving 184 trainee teachers and student teachers, Burmeister and Eilks (2013) found that nearly one third of the participants had no idea about, or a sound understanding of what ESD means. Boon (2011) argues that teacher training for ESD appears to be somewhat ad hoc due to its novelty and ambiguity of its conceptualisation.

Besides that, many authors repeatedly report about numerous challenges for novice teachers to respond to the calls for prioritizing and implementing ESD. Apart from insufficient teachers' knowledge, the following barriers and challenges are most often mentioned in the literature: an overcrowded curriculum, a lack of training opportunities in sustainability education, a lack of teaching experience and inspiring examples of how to incorporate ESD into their teaching, a lack of appropriate teaching resources and guidelines for teachers, a standardized curriculum, testing and assessment system, conflicts between the sustainability education theory and conservative school practices, different levels of perceived relevance and priority of ESD among school leaders and teachers, low level of teachers' self-efficacy beliefs, and a lack of whole-school approach to ESD (Summers, Childs, Corney, 2005; Evans et al., 2012; Nolet, 2009; Jones, Selby, & Sterling, 2010; Borg et al., 2012). For example, in their nationwide study involving a total of 3229 different subject teachers, Borg et al. (2012; 2014) found that teachers' conceptions of ESD and sustainability were largely influenced by their own subject teaching traditions. The findings of their study indicate that science teachers generally utilize traditional teacher-centred and fact-based approach, social science teachers seemed to be most receptive to the ESD approach, while almost half of language teachers stated they did not include ESD principles and topics in their teaching at all. The authors conclude that it is of great importance to provide teachers with further professional support and training adjusted to the needs of different disciplines (Borg et al., 2012).

In addition, while it is generally agreed that teachers' personal beliefs, dispositions or attitudes towards a content area are vitally important in education (Evans et al., 2012; Fives & Gill, 2014; Pajares, 1992; Kagan, 1992), only a small number of studies exploring novice teachers' beliefs of ESD are available both in Latvia and internationally, and therefore little is known about novice teachers' experience, knowledge and beliefs

about the topic. A large number of researches indicate that teachers' beliefs guide and directly affect their pedagogy, behaviour and classroom practices, and therefore it is important to investigate teachers' beliefs in order to understand the way teachers think and act, and consequently improve the quality of teaching and learning. Teachers' beliefs can be thus viewed as "a critical filter for how educators acquire new knowledge and apply it in their classroom" (Mishra, Mehta, 2017). As for education for sustainability, an increasing number of studies have found that teachers' ESD practices are shaped by their personal philosophy and theories, as well as culture and theories that are prevalent in the institutions in which they work (Hart, 2003; Stevenson, 2007; Boon, 2011; Nolet, 2009; Barrett, 2007; Evans et al., 2012). Other factors, influencing teachers' enthusiasm and readiness to implement ESD in their classrooms, include education policy and practical support available for teachers, content knowledge, and school and local community preferences and expectations (Evans et al., 2012). It has been also confirmed that teachers tend to avoid the subject areas that they feel they are less knowledgeable and experienced in (Boon, 2011). Teachers tend to select what to teach and how to teach based on their personal preferences, philosophy, subject knowledge, and experience. Therefore, it is essential to ensure that all teachers are well prepared both theoretically and practically to facilitate ESD in their classrooms.

While many studies focus on novice teachers' beliefs and knowledge about teaching and learning in general, the research on the interconnection of teachers' philosophy, knowledge, and beliefs about ESD and teachers' intention, willingness, and capacity to teach ESD is still limited. This article aims to provide data from this relatively under-reported area.

Research aim and research questions

The aim of the research is to describe novice teachers' understandings and experiences in education for sustainable development. To address the questions raised in the study, the data was collected through semi-structured in-depth interviews, written questionnaires, and document analysis. The study sought to examine novice teachers' beliefs, experiences, and knowledge as regards sustainability and education for sustainable development (ESD). Additionally, the study addressed the barriers and major challenges associated with the implementation of EDS principles in Latvian schools.

Research methodology

Sample

Thirty-two novice teachers, working in 14 Latvian comprehensive schools, agreed to take part in the survey, 4 of them male and 28 female, all at the ages of 21 to 36. All of them are teachers of various subjects, including 4 mathematics teachers, 9 science teachers, 10 language teachers, 5 social science teachers, 2 art and music teachers, and 2 primary teachers teaching different grades ranging from Grade 3 to Grade 12. Twenty-nine of the 32 respondents were trained to teach grades 1 to 12, whilst three were trained

to teach at the primary level. Thirty participants have gone through at least four years of formal initial teacher training at the university level, and two of the participants were last-year university students at the time of the study. Their full-time teaching experience varied from 2 months to 3 years. At the time of the survey, they all worked in the urban public school sector based in two Latvian cities Riga and Rezekne. Finally, all the participants had graduated from different Latvian higher educational institutions. The data was collected between December 2017 and November 2018.

Instrument and procedures

A developmental phenomenographic approach was applied in this study, which is aimed at investigating a full range of ways individuals understand, perceive, or experience a concept or phenomenon (Marton & Booth, 1997). The data was analysed using the Qualitative Content Analysis method. All interviews were recorded, transcribed, encoded and further analysed using the semantic content analysis method to identify categories and subcategories to describe the content. Initially, the data for each of the research participants was analysed, raising and coding the main themes that emerged from responses. Next, the data was analysed by using the cross-analysis method, identifying the similarities and differences between the themes. The connections between emerging themes were identified and examined, and then a number of superordinate themes were identified.

Research results

Understanding sustainability

Remarkably, the findings of this study indicate that the majority of the teachers participating in this study demonstrated insufficient and only modest level of understanding of the terms *sustainability* and *sustainable development*. For the most part, the participants' perceptions of the concepts can be described as fairly fragmented, simplistic or linear.

Based on the results of the interviews and written questionnaires, the participants were grouped into four categories based on their understanding of the terms *sustainability* and *sustainable development* (Table 1). Nine participants of the study could not provide any meaningful explanation of the terms *sustainability* and *sustainable development* (Category 4). The next group of 11 teachers (Category 3) could explain the meaning of the concepts *sustainability* and *sustainable development* in a rather abstract or vague way, assuming that, for example, it is "something long-lasting", "long-term", "having steady impact, long-term impact or result", "durable", "innovative", "important for our society." The next group of teachers (Category 2) based their explanations of sustainability on one or several correct ideas. Teachers in this category generally associated *sustainable development* with only one dimension of sustainability, namely, with economic, social or environmental dimension, whereas the latter was mentioned most frequently. A large number of teachers mentioned such environmental issues as air and water pollution, climate change, and shortage of resources. A slightly smaller number of the participants

linked sustainability only with a social context, focusing on such social issues as social and personal responsibility, the quality of life, poverty, social injustice, inequity, tolerance, social inclusion, democracy, human rights, and peace. Several novice teachers associated *sustainability* only with an educational context, mentioning such topics as life-long learning, the 21st century education, active and hands-on learning. Unlike teachers in the previous two categories, teachers in this category demonstrated a deeper understanding of the concepts, suggesting that they might be related to some kind of “new philosophy”, “new way of life”, “new thinking”, “balanced development” that leads to a life in harmony with nature and with each other, as well as to social and environmental well-being and peace in future. Although this group of participants expressed seemingly correct and relevant ideas in relation to sustainability and sustainable development, they clearly lacked well-developed, theory-based and holistic view of the concepts. Finally, only three teachers in this study could provide a holistic, profound and theory-based understanding of sustainability and sustainable development (Category 1). In their explanations, they focused on the interconnectedness of all three dimensions of a three-pillar-concept of sustainability in a rather meaningful way.

Table 1. Novice teachers' understanding of sustainability and sustainable development

Category	Understanding of sustainability and sustainable development, number and % of teachers (N=32)
1. Good understanding	3 (9.4%)
2. Basically right idea	10 (31.2%)
3. Abstract understanding	11 (34.4%)
4. No meaningful understanding or no answer	8 (25%)

Understanding ESD

The novice teachers participating in this study can be conditionally divided into three groups based on their perceptions of ESD and their roles as educators for sustainability.

- (1) Those who are aware of ESD principles, teaching practices and approaches, and use them frequently in their teaching, as well as are highly supportive of the ESD ideas and ideology.
- (2) Those who are aware of ESD principles, teaching practices and approaches, support the ideas and importance of sustainability and ESD, but are not very active in implementing ESD in their classroom due to a number of reasons and constraints.
- (3) Those who have rather abstract, simplistic, linear, or fragmented understanding of sustainability and ESD principles, teaching practices and approaches, and do not use them intentionally in their teaching.
- (4) Those who are not aware of ESD principles and pedagogical approaches, and do not use them intentionally in their teaching.

The findings from the interviews confirm previous results (Boon, 2011; Birdsall, 2014; Burmeister & Eilks, 2013; Spiropoulou et al., 2007), suggesting that the overall level of novice teachers' awareness and understanding of ESD can be described as insufficient and relatively low. Nearly one third of the novice teachers in this study could not clearly define and meaningfully discuss ESD as an educational approach. The teachers generally tried to interpret the term in a rather general and linear sense, not being able to mention or describe the key ideas, principles and goals of ESD, as well as teaching methods, techniques, and assessment approaches that underpin ESD. Slightly more than one third of the participants gave abstract definitions, mentioning several relevant yet very vague ideas, such as "long-term education", "life-long learning", "responsible learning", "learning for future", and "learning to be environmentally and/or socially responsible." They interpreted the concept in a quite general sense, trying to link ESD with continuity, durability. The most common association in this respect was that "education for sustainable development" means being able to use knowledge in practice after school is finished. However, they could not trace the connection of ESD with global, environmental, economic, or social issues. English as a foreign language teacher: "I can't provide any specific definition of this term, but I may suppose, it relates to such education that has positive, strong and durable impact on students even after they finish school. I mean, the knowledge and skills they acquire in school will be relevant and practical for them throughout their lives."

Many novice teachers in this study described ESD as education about the environment. The teachers assumed that ESD seeks to inform students about facts and concepts about ecological systems and environmental issues, processes, and problems, which are aimed at raising students' awareness and enhancing their motivation to take care about the environment and nature. Geography teacher: "The term refers to teaching and learning about different environmental issues. I suppose one of the major goals of *education for sustainable development* is to teach children about the ways how we all can protect and sustain our planet and resolve the problems that might affect the environment now and in future. We have to inform and empower students to take responsible actions to respect and protect the environment locally and globally." Chemistry teacher: "Involving students in meaningful academic activities that will help them to see what they can do to protect and preserve the environment." Similar findings are presented in the works of Evans et al., (2012), Burmeister and Eilks (2013).

A smaller number of teachers could mention one or several correct and clear ideas in relation to ESD, such as "educating students to take personal responsibility for a sustainable future", "taking sustainability into account when planning and organizing lessons in school", "teaching students critical thinking skills and personal responsibility for their lives", "education that empowers students to be effective and responsible members of society", "teaching skills that are applicable outside school and in future", "teaching students to make informed decision and choices, think critically and in systems." However, their answers also demonstrated a lack of an integrated approach to ESD, and a certain gap in knowledge, especially concerning ESD key competences, teaching methods and approaches.

Finally, only three teachers were able to provide a much broader, holistic explanation of ESD, managing to link a range of sustainability-related ideas, principles, and goals, as well as mentioning teaching methods and approaches that can be used to achieve these goals. Mathematics teacher: “Education that develops students’ knowledge, skills, and attitudes that help them see the causalities, think in systems, solve problems, and take responsibility for their own actions; education that increases students’ awareness of the environmental, social and economic issues and their inter-relatedness, and finally helps them to make informed decisions and become responsible and efficient members of society. Education that is action-driven, multidisciplinary, democratic, and transformative.”

Novice teachers’ attitudes to and experiences with ESD

The participants of the study were asked to consider the importance of sustainability-related practices and issues in the curriculum and in their professional practice. Overall, the results of the attitudinal questions of the interviews demonstrate that novice teachers generally think that sustainability is “good”, “important”, and “necessary”, which, however, does not always correlate with teachers’ degree of awareness of sustainability and ESD. Almost one third of the participants indicate that they are confident about being able to include ESD in their teaching, are willing to do so, and evaluate their pedagogy as sustainable. More than half of the participants accept that they require additional training and professional support to reach the level of knowledge and skills necessary to implement ESD in their classrooms effectively.

As shown in this study, the majority of the novice teachers still rely on a more conservative, transmissive teaching tradition, however, some ESD-related teaching approaches and methods, such as active learning, learning through action, inquiry-based learning, student-centred practices, and interdisciplinarity, were also emphasized by at least one third of the participants. In addition, slightly more than 20 percent of the novice teachers could not identify any aspects of ESD in their teaching practice. In addition, remarkably, several teachers expressed strong scepticism about sustainability and ESD, stating that “such kind of practices and methodology” is almost impossible to implement in their classrooms, taking into account the prevailing conditions in schools and in the society.

Enabling and constraining factors in relation to ESD

The study sought to highlight the barriers that novice teachers generally experience incorporating ESD into their teaching practice. When asked about the major challenges, most teachers mentioned the discrepancies between sustainable development and the conservative teaching traditions and culture in their schools, inadequate professional experience, expertise, and knowledge in relation to ESD, a lack of relevant teaching resources and guidelines, a lack of knowledge and role models of how to incorporate the ESD into their classroom practices, a lack of professional support in schools, and an

over-crowded curriculum. Many previous studies describe similar barriers and issues that typically arise in relation to ESD (Summers, et al., 2003; Nolet, 2009; Evans et al., 2012; Uitto & Saloranta, 2017). It should be noted that a large number of teachers in this study expressed the concerns that prevailing features of public schooling such as hierarchical patterns of personal relationships, competition between individuals, standardized testing and grading systems, narrow individualism, ego-centrism, and the leading role of personal success over collective benefit, do not contribute to the development of sustainability values, attitudes, and practices among students and teachers.

Many novice teachers indicated that participation in different professional development activities, including seminars, lesson observations, open lectures, had helped them to feel more confident to adopt the more learner-centred, competency-based and transformative pedagogy of ESD, however, they also noted, that they require more opportunities to learn these “new” methods in practice, rather than in theory. Most teachers expressed a strong desire to have much more frequent discussions of sustainability and ESD issues with their colleagues and school leaders, as well as during their professional development courses. They also emphasized the importance of a whole-school approach to ESD.

Conclusions

Implementation of ESD relies greatly on individual teachers’ philosophy, beliefs, enthusiasm, theoretical knowledge and practical expertise. Teachers play a central role in successful implementation of ESD in schools. With the increasing importance to incorporate ESD within the curricula, teachers of the 21st century will face additional challenges in an effort to adjust the requirements of the existent over-crowded curriculum to the priorities and principles of the education for sustainable development. Although internationally it is widely accepted that education for sustainable development has to become an important part of both formal and informal education at all levels, researchers have repeatedly emphasized school teachers’ inadequate knowledge, expertise and preparedness to include ESD into their classroom practices.

The aim of the study was to reveal the range of ways in which a sample of volunteer novice teachers understood and experienced ESD, as well as how ESD relates to their professional practice. The study revealed several worrying findings in relation to the novice teachers’ understanding of sustainability and ESD and their current capacity to teach ESD. The results of this study indicate that the novice teachers tend to focus largely on individual aspects of sustainability and ESD, failing to see the whole picture and trace the interdependence of all dimensions of sustainability. In addition, they appear to lack “a deeply personal philosophical vision” (Badjanova et al., 2014) of sustainability and ESD. Many teachers seem to be well aware of the ecological dimension of the sustainability and ESD; however, they tend to neglect other dimensions. The novice teachers participating in this study seem to lack the clarity of understanding of sustainability-related concepts. Many teachers could not say whether they had been exposed to ESD earlier, and too many were not able to explain explicitly how their way of thinking, acting,

and professional practice relates to sustainable development and ESD. This might be attributable to two factors. First, as some scientists claim that education for sustainability is described as a multidimensional concept with no single specific definition due to a variety of different local contexts, as well as due to insufficient conceptualization of the terms and its conceptual ambiguity. Second, the results point to the likelihood that novice teachers had only very limited explicit and systematic exposure to sustainability-related concepts and practices during their studies. In addition, it seems problematic that those participants who affirmed the engagement in ESD practices were likely to have very simplistic perceptions of what ESD implied and constituted. For example, several teachers suggested that their task was to teach “to sort waste” or “to use paper bags instead of plastic.” It would appear that a more structured, theory-driven, systemic and holistic understanding of and approach to sustainability and education for sustainability is required to promote ESD practices in schools.

Taken together, the findings of this study support the idea that there is a need for more purposeful and systematic efforts by initial teacher education institutions and professional development programs to prepare novice teachers to implement ESD, which is similarly emphasized in many recent studies, for example, by Uitto and Saloranta (2017), Borg et al. (2012), Burmeister and Eilks (2013). It is also important to provide further professional training and support for teachers in accordance with their individual needs and the needs of different disciplines. Novice teachers' professional needs as regards ESD should be analyzed more thoroughly and taken into account when planning and designing teacher training and professional development courses. Importantly, teacher education programs should address the fundamentals of ESD more explicitly and meaningfully, including key topics and issues of sustainable development, key pedagogical approaches and methods in ESD, assessment approaches and key competences in ESD. For ESD to be more effective, it is also of high importance to ensure such a whole-school approach wherein novice teachers are professionally supported and guided, and are able to draw on more experienced teachers' expertise and experience in ESD.

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