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Editorial

This issue of the *Journal of Teacher Education for Sustainability* is a special one as it celebrates the 10th anniversary of Baltic and Black Sea Circle Consortium on Educational Research and also marks the end of the UN Decade of Education for Sustainable Development. Besides, the publication of the journal for the first time is financed by the project “Support for International Cooperation Projects in Science and Technologies at Daugavpils University” (No. 2015/0010/2DP/2.1.1.2.0/14/APIA/VIAA/002). As invited guest-editor I would like to thank all the members of the Editorial Board for their hard work reviewing the articles submitted for the publication in JTEFS. My thanks are also due to the authors of the papers for their industry and patience in the long process of preparing articles for publication. Finally, the credit certainly goes to the language editors for their great work.

The current issue of journal includes six papers from Latvia, Estonia and the Netherlands demonstrating the wide range of research methodologies and topic areas. The issue features both the theoretical and empirical studies based on the educational action research, quantitative and qualitative surveys, and bibliometric analysis.

In an opening article, Pipere and her colleagues discuss the research output performance of Baltic and Black Sea Circle Consortium in Educational Research members and other scholars published in JTEFS during this last decade. Using the methodology of bibliometric study the authors describe the main bibliographic indicators of JTEFS and provide the qualitative and quantitative analysis of research paradigms and their developmental changes in the papers published by JTEFS (2005–2014). In general, journal has evolved in line with the advanced trends in educational research, research in teacher education, research in sustainability education and sustainability studies in higher education. The analysis of published papers indicates both the progress and issues of research in teacher education for sustainability. The authors conclude with some visionary insights into the further development of JTEFS and this research field in general.

In their paper, Mediema and Bertram-Troost present their theoretical reflections on citizenship education and religious education. They scrutinize the theoretical, political and practical contexts of the relationship of global citizenship and worldview education. The main focus is on the connection between the concepts of ‘worldview education’ and ‘global citizenship education’ from the point of view of inclusivity in respect to both concepts. The authors suggest that Habermas’s distinction between the concepts of democratic state citizenship and global or cosmopolitan citizenship has been conceptually helpful for the question under discussion. They also argue whether there is a certain educational, political or religious necessity to deal with this possible relationship on a national as well as global level in the context of social sustainability.

The paper by Jonâne highlights the role of analogies as the tool for teaching difficult science concepts. The application of analogies in the context of sustainable education involves the rich potential; it can facilitate the analogical thinking, transfer skills, as well as abilities required for life and lifelong learning. The study identifies the Latvian physics teachers’ views on the importance of analogies, the methodology of their usage in physics education, as well as the innovative examples of analogies. As the study shows, while all surveyed teachers sometimes use the simple analogies in their classroom instruction just to illustrate some material, several teachers also use them purposefully to help...
students build their knowledge by activating, transferring, and applying existing knowledge and skills in unfamiliar situations.

Jurgena and colleagues analyze the views of preservice teachers on the role of innovations and traditions in the work of the academic staff at their institution of higher education. The survey data from 192 full-time and part-time first year students at Riga Teacher Training and Educational Management Academy show that readiness for innovative activity and active involvement in the creation, acquisition and application of innovations is an essential factor in the work of the academic staff. The results indicate that, according to the views of preservice teachers, in the context of pedagogy the innovation refers to the process of educational reforms, the selection of the most appropriate teaching material, and the creation, acquisition and application of innovations in the pedagogical practice.

In their paper, Kravale-Pauliņa and Oļehnoviča report on participatory action research study into civic initiatives for securitability involving novice teachers and youngsters from Latgale region of Latvia. Research participants evaluated national planning documents, improved their knowledge and devised civic initiatives to improve the quality of life. Focus group discussions and reasoned argumentative essays were employed to establish how novice teachers and youngsters make sense of the ‘human securitability’ concept. The action research exposed initial understanding of research participants regarding the human securitability and possibilities to improve quality of life and provided an environment to deepen their understanding of said phenomena and participate in different educational events envisioning practical engagement with securitability and civic initiatives.

The paper by Ulavere and Veisson provides an outline of values that principals, teachers and parents of preschool child care institutions consider important to be taught to children, and through which activities, in their estimation, values education is implemented in child care institutions. More important values to be taught to children, as seen by principals, include sense of humour as well as pride and inventiveness, whereas teachers value patience as a significantly more important value to be taught. Compared to principals, parents consider confidence and commitment more important, while, comparing to teachers, parents consider more important that kindergartens place value in good education. Values education in child care institutions takes place primarily in adherence to the relevant group’s rules in the course of everyday communication and activities. Personal role models are considered to be very important in values education.

We anticipate that published papers will serve as a notable contribution to the further development of research in teacher education for sustainability and wish for JTEFS all the best for the next decade.

Guest editor
Anita Pipere
Developing Research in Teacher Education for Sustainability: UN DESD via the *Journal of Teacher Education for Sustainability*

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Abstract

This study marks the end of the UN Decade of Education for Sustainable Development that coincides with the 10th anniversary of the Baltic and Black Sea Circle Consortium on Educational Research (BBCC), and aims to analyse the research output performance of BBCC members and other scholars published in the *Journal of Teacher Education for Sustainability* (JTEFS) during this last decade. Using the methodology of bibliometric study and literature review, the authors describe the main bibliographic indicators of JTEFS and provide a qualitative and quantitative analysis of the research paradigms and their developmental changes in the papers published by JTEFS (2005–2014). The results of the study show that in general the journal has evolved in line with the advanced trends in educational research, research in teacher education, research in sustainability education and sustainability studies in higher education. The analysis of published papers indicates both the progress and issues of research in teacher education for sustainability. The authors conclude with some visionary insights into the further development of JTEFS and this research field in general.

*Keywords:* JTEFS, teacher education, sustainability, research paradigm, bibliometrics

To achieve its goals, research in any discipline needs to be disseminated both locally and globally, and for novel fields of study, the establishment of academic periodicals designates a certain maturity and illustrates striving towards academic quality and recognition. This extensive paper is the first attempt to focus on research in the field of teacher education (TE) for sustainability through the publications of the *Journal of Teacher Education for Sustainability* from 2005 to 2014. This period coincides with the UN Decade of Education for Sustainable Development (DESD); therefore, framing the research development in TE in line with local and global needs and contexts.
Zooming Out and In: The Contemporary Contexts of JTEFS

In order to ensure a full-fledged overview of JTEFS, a short review embedding the establishment and growth of JTEFS in its specific historical and geographical context would be appropriate. The origins of JTEFS are connected with several international developments and local events that will render a more profound understanding of this academic phenomenon.

At the end of the 20th and beginning of the 21st century, Latvia can be characterized as a small developing country in the Baltic region, situated at the crossroads of northern and eastern Europe. At that time, Latvia had recently regained its independence and was striving to change all spheres of social, economic and political life including education. Reorganisation, change and rapid development also became habitual features in higher education institutions and TE in particular.

Daugavpils is the second largest city in Latvia, and is the location of one of the country’s few state universities – Daugavpils University (DU) – which is still a very small university if we compare with the average size of universities in larger European countries. Since its establishment in 1996, the majority of the activities performed by the Faculty of Pedagogy and Psychology at DU has been oriented towards the development of TE and training. In 2000, the faculty joined the international network of Teacher Education Institutions associated with the UNESCO Chair on Reorienting Teacher Education to Address Sustainability at York University in Toronto, Canada, led by Charles Hopkins. Considering the research potential of the faculty, it was suggested that one of its activities in this network could be the publication of a new international journal for the dissemination and appropriation of experience gained at the university and through international cooperation. The intention was to demonstrate a contemporary focus and the proposal of solutions to problems in TE in Latvia as well as theoretical and practical approaches to TE for sustainable development (SD) in other countries. Consequently, in 2002, the first issue of Journal of Teacher Education and Training (since 2007 – Journal of Teacher Education for Sustainability) was published as the first international peer-reviewed journal in the sphere of education in Latvia at that time. In order to invigorate and extend the cooperation of TE institutions in northern and eastern Europe aiming to integrate sustainability in their educational discourse, in 2003, the 1st International JTET Conference “Sustainable Development. Culture. Education” was held at DU. In the same year, the Institute of Sustainable Education (ISE), chaired by Professor Ilga Salite, was established at the faculty.

It is no coincidence that simultaneously with the launch of the UN DESD, the Baltic and Black Sea Circle Consortium (BBCC) was established in 2005 on the initiative of ISE. By its 10th anniversary, the BBCC is an international network that unites the efforts of researchers and practitioners from more than 20 countries in the field of TE for sustainability. BBCC was originally created on the basis of the cooperative network of the Journal of Teacher Education and Training. The regular meeting place for BBCC members throughout these years has been the annual international conference “Sustainable Development. Culture. Education” hosted since 2003 by a different consortium member state each year. The conferences offer the opportunity for researchers and teachers to join a ‘family’ of like-minded enthusiasts and get involved in collaborative research and international networking; they have also served as leverage to maintain the editorial and submission process of the JTEFS.
As outlined in the journal’s guidelines, JTEFS is a forum for the meeting of different views, ideas and research to promote the further development of studies and practices in TE in all areas of formal and non-formal education in relation to sustainability. Its policy aims to encourage the submission of articles relevant to the content and form of teacher professional and academic education, the problems and tasks of teacher in-service education and other issues that help teachers become responsible mentors for sustainable development. It is the only journal in the world targeting TE in connection with sustainability. In communication with potential authors the Editorial board at JTEFS has always emphasized the need to respond to the demands of different global movements toward sustainability in education, starting with the network already mentioned by the UNESCO Chair at York University, but also helping to implement the UNESCO Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability (UNESCO, 2005) and monitoring the success of UN DESD in the field of teacher education.

This paper is not the first attempt to reflect on JTEFS as a meeting place for researchers in TE for sustainability. In 2005, a short vignette about the journal was included in the UNESCO Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability (2005), stressing the main historical milestones the journal has attained. In 2007, professors Ilga Salite and Anita Pipere were invited to outline the history of the journal and present its context in the UNESCO publication, Good Practices in Education for Sustainable Development: Teacher Education Institutions (Salite & Pipere, 2007). In this publication, the innovative aspects, effects, results and impact of JTEFS were described for the first time. In terms of success factors, it highlighted ...

...the network of universities emerged using the “snowball” approach within the JTET Conferences. We also sought to identify selfless, devoted, and committed scholars interested in teacher education, education for sustainable development, and sustainable development. The international team of the editorial board for many years has been extraordinarily responsive and has provided outstanding support for this project. Cooperation among universities and scholars has been maintained continuously over the years. (Salite & Pipere, 2007, p. 44)

At the end of the chapter, the authors put forward some future initiatives to ensure the viability and momentum of the project including several tasks: 1) to establish the journal as an indexed peer-reviewed publication, included in major publication databases, 2) reorient the content of JTET articles more clearly toward topics of TE, sustainable development, and education for sustainable development, 3) increase the number of contributions from doctoral students. The current paper, among the other things, will illustrate the level of the present attainment of the goals set for the journal in 2007.

The paper is structured as follows. The next section envisions the research in TE for sustainability, embedding this specific field of inquiry in more general areas of educational research, TE research, education for sustainable development (ESD) research and research in higher education (HE) for sustainability; therefore, setting up the criteria for the further empirical analysis of JTEFS articles. The section Researching the research, details the methodological underpinnings of the study, while the Results section highlights the main bibliometric indicators, describes the research paradigms and their developmental dynamics within JTEFS (2005–2014). The final chapter summarizes, interprets and puts the main contributions of this study in perspective.
Research in Teacher Education for Sustainability: Building up the Field

To provide an insight into the research in the field of TE for sustainability over the last decade is not an easy task due to almost non-existent reviews on this specific topic and the scarcity of overviews on more general topics related to this discourse. To manage this task, we will attempt to nest the TE research in the more general field of educational research, as well as to scrutinize the research on ESD and sustainability. Furthermore, as a bridge between the educational/TE research and ESD research, research in HE for sustainability will be analysed since TE can be viewed as unequivocally embedded in the context of HE. At the end of the chapter we will briefly summarize and integrate all the research areas mentioned above for the research topic of TE for sustainability. To link the mentioned subject matter with the journal discourse, the research outlines will be correspondingly connected to the issue of knowledge dissemination in academic publications.

Educational Research

The American Educational Research Association (AERA) currently defines educational research as a scientific field of study that examines education and learning processes and the human attributes, interactions, organisations, and institutions that shape educational outcomes. Scholarship in the field seeks to describe, understand, and explain how learning takes place throughout a person’s life and how formal and informal contexts of education affect all forms of learning. Education research embraces the full spectrum of rigorous methods appropriate to the questions being asked and also drives the development of new tools and methods. (AERA, 2015)

Educational research, as a domain of academic inquiry, is a relatively young field; hence, several issues relating to research activities and approaches are still under negotiation. For instance, one such point of discussion pertains to the relationships between empirical and theoretical research. Although educational research published in top journals contains not only empirical research but also policy analysis, discussion papers, meta-level research and so on, currently it seems that the academic community of educational research values empirical research higher than theoretical work, since the natural sciences has already been used as the model for several decades (Standish, 2007). Though, some scholars admit that educational research that is based on the empirical traditions of the social sciences should be distinguished from different forms of research grounded in the humanities, theoretical, conceptual or methodological essays, and critiques of research traditions and practices (Smeyers, 2008). Therefore, the roots of natural and social sciences and humanities can all be traced in current educational research, albeit in different proportions depending on the context.

In terms of methodology, the contextualisation of theoretical insights is necessary for educational research, since many doubt if one can establish universal laws in the social sciences. Nevertheless, the majority of research in this field still uses quantitative methods, although the importance of qualitative studies has accrued at a significant rate. Notwithstanding, present-day educational research is related to positivist, post-
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positivist and postmodernist paradigms that envisage both empirical and theoretical research and the blend of quantitative, qualitative and mixed methods.

The AERA panel recommendations, provided in 2006, in some instances, can be used as a valuable tool in order to analyse the research paradigms encountered within a journal on educational research, although, several critical voices were heard afterwards (Howe, 2009; Smeyers, 2007) in regard to excessive empathy with the positivist research paradigm. AERA calls for consistent terminology, a full description of data collection and analysis methods together with the research context, a relevant theoretical framework, connection between TE and students’ learning, multi-disciplinary and multi-methodological approaches, more in-depth multi-institutional case studies of TE programs and their components, etc. (see Zeichner, 2005).

The authors of this paper tend to agree with Smeyers (2008), who proposes the idea to resign from several traditional dichotomies such as values/facts, objective/engaged, researcher/practitioner, concept/fact and qualitative/quantitative/interpretive while engaging in educational research. According to Shulman (1997), educational researchers should not ensue some particular method, they must first understand the problem and decide what questions they are asking then select the mode of disciplined inquiry most appropriate to those questions.

The volume of this paper does not permit the full scope of contemporary methodologies and theories used by researchers in educational studies to be analysed; therefore, we will briefly sketch only two examples of novel research approaches – design-based research and complexity theory that could be successfully applied in the field of educational research.

Design-based research is oriented to the problems of practice and can help create usable knowledge about developing, enacting and sustaining innovative learning environments (DBRC, 2003). Such research takes place through continuous cycles of design, enactment, analysis and redesign (Cobb, 2001; Collins, 1992), and it must account for how designs function in authentic settings and lead to sharable theories that help communicate relevant implications for practitioners and other educational designers (cf. Brophy, 2002).

One of the recent theoretical approaches that can be advisedly used in the field of educational research is complexity theory. However, the theory of holism as a predecessor of complexity theory in educational research has already reaped the fruits of unconventionality for a couple of decades. Although it is an eclectic and inclusive approach to education, in its core it aims to nurture wholeness in all aspects of traditionally segmented and compartmentalized educational discourse like individual development, relationships between the individual and the world, disciplines of knowledge, educational aims and so on. The holistic approach to education, based on the principles of interdependence and connectedness, also focuses on the meaning-making aspects of education and stands against the materialistic, consumerist and spirit-denigrating culture (Mahmoudi, Jafari, Nasrabadi, & Liaghatdar, 2012). In terms of research methodology in social sciences, methodological holism suggests that “social relations can only be interpreted and explained in terms of social wholes” (Mittelstrass, 2014, p. 8). Some authors consider the concept of emergence as the theoretical link between holism and complexity (for a more extensive explanation, see Agazzi & Montecucco, 2002; Law & Mol, 2002; Mittelstrass, 2014). However, literature studies show that complexity theory has probably gained larger popularity in the natural sciences than in social disciplines.
Several qualities featuring complexity like self-organisation, self-maintenance, and the tendency to be nested within other systems might be applied to many phenomena characteristic of education; for example, individual sense-making, teacher-learner relationships, classroom dynamics, school organisations, community involvement in education, bodies of knowledge, and culture (Davis & Sumara, 2008). Further, some strategies of complexity theory can be relevant to phenomena within educational discourse. One describes the “level jump” expedient to understanding the transphenomena prevailing in education – the researcher focuses on the phenomenon, its particular coherence and behaviour, and, at the same time, examines the context and conditions of its emergence. Another two strategies relate to transdisciplinarity and interdiscursivity – the integration of different discourses usually applied in segregated contexts.

The authors agree with Davis and Sumara (2008) that education and educational research conceived in terms of expanding the space of the possible rather than perpetuating entrenched habits of interpretation, then, must be principally concerned with ensuring the conditions for the emergence of the as-yet unimagined or the currently unimaginable. An education in terms of complexity cannot be conceived as a preparation for the future, rather it must be construed in terms of participation in the creation of possible futures. Complexity theory stresses the networks, linkages, holism, feedback, relationships and interactivity in context (Cohen & Stewart, 1995), emergence, dynamic systems, self-organisation and open systems (rather than the closed world of the experimental laboratory) (Davis & Sumara, 2008) that could also be applied within sustainability science. However, we should be cautious since complexity theory can suggest what to do if one wishes to promote development, but it does not tell us if those actions are desirable. One should also deliberate whether bringing complexity theory into education while avoiding matters of a moral nature is acceptable and does not turn into some form of scientism (Davis & Sumara, 2008).

Teacher Education Research

There is substantial evidence (both empirical and philosophical) that research has a major contribution to make to effective TE in different ways (BERA, 2014). Further, there is a growing demand both for research about teaching and TE and research “consumed” by teachers and teacher educators (Erixon & Gun-Marie-Kallós, 2001). Research can make a positive contribution to each aspect of teacher professional knowledge: practical wisdom, technical knowledge and critical reflection (Winch, Orchard, & Oancea, 2014).

Borko et al. (2007) have discerned four genres of TE research that will be used in this paper to classify research reports published in JTEFS. The first genre, “effects of TE research”, is based on the positivist paradigm of natural sciences and can be related to quantitative inquiry. Such research attempts to reveal the general patterns of relationships between student teachers, TE practice and programmes, and the learning of student teachers and school students using research methods like experiments, quasi-experiments and correlational research. The research on the effects of TE research can be helpful in designing and evaluating TE programmes. However, the generalizability of effects in TE is not always useful because of the contextual and local nature of teaching and learning (Borko, Liston, & Whitcomb, 2007).
The second genre, “interpretive research”, holds the features of qualitative inquiry aiming to grasp the local meanings. The specific situation is illustrated in its wholeness from the perspectives of participants. Such research provides a detailed interpretation of local variations of settings, actions and sense-making of contexts and activities. This research aims to improve practice, illustrate success and issues of policy enactment and shape theoretical development. Interpretive research tries to comprehend the socio-cultural processes in natural settings related to TE. The data collection and analysis methods for this genre are in tune with that of qualitative research. Interpretive research has contributed to our understanding of TE courses and field experience, the work of teacher educators and the essence of valuable TE programmes as well as the impact of such work and programmes on the professional development of student teachers (Borko et al., 2007).

The third research genre, “participant research”, can essentially be viewed as part of qualitative or interpretive research. It features the specific role of the researcher and the purpose of the research: the research is conducted by those who do the work of TE in order to understand and improve practice within a local context; therefore, blurring the boundaries between research, practice and improving the practice of TE. This type of research includes action research, participatory research, self-study and teacher research. Such studies should be adequately reported following all the requirements for high quality research articles, since in this way such research serves not only the purpose of improving the researcher’s practice but also increasing the possibility of using studies by professional peers.

The last and most recent research genre in TE is design research, already mentioned above. It allows close links between practice improvement and theory development. In the area of TE, a research team might design and enact an educational environment for future teachers and explore their development in this environment. The idea of such research is not the creation of generalizable and replicable educational programmes, but rather the adjustment of the TE process in tune with the continuous assessment of individual and collective activity (Borko et al., 2007).

Research in TE has been criticized for its inconsistent quality and inability to respond to the most urgent problems of the field, although, as with educational research, it is a relatively new field of study. Rigorous, large-scale research on TE is difficult, time-consuming and expensive to conduct; therefore, some of the theoretical and methodological advances seen in more mature fields are just beginning to emerge in research on TE. Currently, TE research consists mainly of smaller-scale studies using interpretive and participant research, typically carried out by teacher educators individually and collectively, or in collaboration with schools or student teachers. The reviews conducted both in the US and UK attest to the scarcity of larger-scale studies providing system-wide and policy-oriented research evidence, and the notable lack of studies performing a full inspection of the various aspects of TE (BERA, 2014; Tatto, 2013). However, while interpretive and participant research is not quite relevant to respond to the current policy challenges in TE, they have convincingly proved the complexity of the TE area.

To conclude, for TE research to influence the “crafting of wise policy, the improvement of practice, and the development of theory, we must ensure that it draws from multiple disciplines, is pluralistic in its methods, and is rigorously conducted and reported” (Borko et al., 2007, p.16). One of the most important contributions JTEFS can make is to help push the field forward – to improve the quality and impact of TE research.
Research in ESD/Sustainability Education

The research in ESD/sustainability education is a field of study that is also not fully established and even not sufficiently discussed among scholars, although the last decade shows a movement toward more complex forms of research activities (Tilbury, 2011). With the apparent aim of helping countries establish local ESD research, UNESCO (2012) recently created the Guidelines for Creating a National ESD Research Agenda and Plan where ESD research is viewed as a sub-field of educational research or research related to education, public awareness and training, and is conducted in formal, non-formal and informal educational settings. Invited experts have discerned nine themes as central to ESD research; for example, tracking the progress of the DESD, conceptual analysis of ESD, the contribution of ESD to the sustainability of society and the educational community, efforts to support or hinder ESD. These themes can be performed via the four tenets of ESD, namely: improving access to and retention in quality basic education, reorienting existing educational programmes to address sustainability, increasing public understanding and awareness of sustainability and providing training (UNESCO, 2012). However, it should be observed that nations practising ESD differ greatly in their institutional settings, which are in turn embedded in wider socio-cultural processes. The ESD research conducted in countries with pronouncedly distinct cultural and historical backgrounds could also bear the specific features that enrich the global concept and understanding of ESD and sustainability.

The current topics in ESD research identified by the survey of researchers from different countries mostly align with those discerned by UNESCO. The majority agree that ESD research should be aimed at examining the current situation in the field, developing models for personal and societal life in the future, changing human awareness and actions toward more sustainable lifestyles and responsibility toward the rest of the world. Some researchers have prioritized a new vision of education (awareness, self-regulation, world views, etc.), recognized the need for the evaluation of ESD and the development of contextualised educational models (Pipere, Reunamo, & Jones, 2010).

In relation to the development of a distinctive methodology for ESD, scholars still probe for relevant approaches, trying to adapt and design research instruments (Reunamo & Pipere, 2011). The Reunamo model of agentive perspective (Reunamo & Pipere, 2011) has been adapted for ESD research to evaluate the research in terms of four orientations that dovetail the descriptions and classifications of educational and TE research provided above. In the qualitative research orientation (adaptive and accommodative research), the researcher is interested in the phenomenon as an experience of something real and seeks to adapt to it. Embarking on quantitative inquiry (adaptive and assimilative research), the researcher applies predefined assumptions to an existing environment. In the theoretical research orientation (agentive and assimilative research), a theory is built or applied to describe the dynamics of the phenomenon in order to find ideas that contribute to environmental change; and in participative research orientation (agentive and accommodative research), the research itself is seen as a possible vehicle for environmental change (Reunamo & Pipere, 2011). Therefore, in ESD research, qualitative studies should be aimed at understanding the motifs and discourse of SD, quantitative research evidently will help to obtain a valid and generalized picture of SD and its mechanisms, theoretical research will try to create tools to connect the past and future, while participative inquiry will deepen the researchers’ awareness of their role as producers of cultural content and
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the ingredients of SD (Reunamo & Pipere, 2011). In the present article, these four orientations will be used to evaluate the research paradigms in JTEFS.

ESD/sustainability education research also has several issues to be considered aiming toward the development of this field. To start with, in order to perform a scientifically rigorous investigation in any field, one has to present the unitary research object that does not raise doubts for the majority of the researchers in the given field. Several authors point to the lack of unity in terms of conceptual and methodological issues in ESD research (Nolet, 2009; Kopnina & Meijers, 2014; Reunamo & Pipere, 2011, 2012; Stevenson, 2006; Wals, 2010). Besides, the very objectives of ESD need further critical reflection (Kopnina & Meijers, 2014). Several voices also warn that in the majority of ESD research, there is a habit of ignoring the deep ecological and indigenous perspectives (Anderson, 2012; Naess, 1973) and exhibiting an anthropocentric bias (Kopnina, 2012). To consider this implication in this paper, we will use the philosophical criteria of the classification of papers in terms of their anthropocentric/non-anthropocentric orientation (Thompson, 2000).

The other issue could be the urgent need for negotiation in terms of relationships between the concept and purpose of education and that of sustainability. Sund and Lysgaard (2013) express caution about the risk of focusing on societal outcomes and changing public behaviour rather than on educational processes. One should ask if ESD really promotes the acquisition of knowledge and understanding, and supports the development of independent thought or mainly stresses the aim of behaviour modification through education. In trying to change practice and ways of life, one should not forget the moral aspects of teaching and learning. Sund and Lysgaard (2013) point to the importance highlighted by philosopher Hanna Arendt that any political use of education is just indoctrination, while the real purpose of education is to create a space for explorative actions. A normative education focusing on particular societal goals can be disadvantageous to the participating individuals and their personal abilities, action competences as well as the practice of more informed actions. However, giving more freedom to students, SD can be an interesting and challenging concept for discerning the different stakeholders’ perspectives (Sund, 2015). ESD research can lose its connection to advanced educational research if it focuses primarily on quick fixes to social problems and fast life-style changes. Besides, in conducting ESD research, one needs to have a deep understanding of educational philosophy and the theories of education to make explicit educational and philosophical assumptions about ESD research. Furthermore, the major issue for journal editors has been the insufficient contextualisation of many manuscripts in the research area (Payne, 2009).

The more radical voices (Knutsson, 2013) suggest that academics should clearly see the boundary between empirical research and ideological indoctrination. The ideological assumptions to be included in the foundation of the empirical research of ESD need to be fully recognized, discussed and problematized so as not to conceal some important ideological tensions and contradictions. The question is: how aware are ESD researchers when they use ESD as a scientific concept or as a political instrument. It is important that ESD researchers explore not only the normative definition presented by UNESCO, but also how the multiple meanings of ESD unfold in educational practice (Öhman, 2011). Knutsson (2013) uses the term post-politics to describe the offering of sophisticated, technical and administrative solutions to ‘problems’ that are actually related to conflicts of interest and inequality. The research of ESD should not be turned
into a means to depoliticiize societal conflicts through conceptual flexibility, responsibilization where the individual subject is expected to find individual solutions to structural problems and contradictions, and the redefinition of ’the political’ in terms of individual morality, competence and resilience. One should not approach ESD as a liberal government technique that aims to produce responsible and resilient subjects, but rather as an opportunity to ensure the circumstances for the emergence of a sustainable future.

Research in Higher Education for Sustainability

The analysis of current trends in research in HE for sustainability through an international literature review of 110 journals from 1992–2012 (Barth & Rieckmann, 2013) shows a strong increase in publications since 2008 and the stabilisation at a high level since then. About half of the publications focus on curriculum development and teaching/learning approaches. Such topics as organisational change/learning, student and lecturer views, the development of sustainability in HE in different regions and the assessment of learning outcomes were represented less often. The thematic focus of this research field can also be shown through the analysis of articles published in the first ten volumes of the Journal of Higher Education for Sustainability (Wals & Blewit, 2010). Among the most popular topics were environmental management/campus greening (25% of articles), integrating sustainability in different disciplines (17%), and pedagogy, learning and instruction (17%). Such topics as theoretical concepts, community partnerships, organisational learning, curriculum, quality assurance and professional development were investigated less often.

In terms of research methodology, Barth and Rieckmann (2013) have identified that half of the analysed papers feature case studies (52%); conceptual papers are the next largest group (22.3%), then come surveys, longitudinal, cross-sectional and trend studies (11.5%). The papers from the journals analysed also contained methods such as naturalistic and ethnographic research, action research, historical and document research. The three most popular data collection tools were survey, document analysis and interview. The authors conclude that there are enough descriptive studies and that the field needs a larger number of exploratory and explanatory studies. Several authors have also admitted the lack of comparative studies contrasting policies and practices in multiple institutions in regard to sustainability initiatives and the implementation of sustainability (Corcoran, Walker, & Wals, 2004; Swearingen White, 2009; Vaughter, Wright, McKenzie, & Lidstone, 2013; Wright, 2002).

According to Tilbury (2011), the main trends observed in the last decade in research in HE for sustainability have been inter- and multi-disciplinary, transformative research with a social impact focusing on social and structural change, where the researcher is a partner and the research is conducted not on people but with people. The new wave of research challenging the dominant research paradigms and research practice critically reflects on the role of research in reproducing exploitative relationships with people and the environment. The researcher should be conscious and explicit about the power, politics and participatory relations underpinning research practice that handles critical questions. For example, among other questions: Who commissions the research and for the benefit of whom? Who can access the research and how? How is complexity embraced within the research? Is there congruence between the ‘what’ and the ‘how’ of the research?
One of the issues connected with this field is that most of the universities that engage in the issue of sustainability are universities that have a focus on education rather than on research. Strong research universities tend to pay less attention to both ESD and sustainability in general (Wals, 2013). Moreover, although the single projects in HE toward sustainability seem to be relatively easy to launch, attempts to mainstream the sustainability agenda across HE has so far failed to have any impact (Tilbury, 2011).

**Research on Teacher Education for Sustainability**

To summarize, the research on TE for sustainability therefore can be constructed and critically deconstructed grounded on the interplay of educational research, TE research, ESD/sustainability research and HE for sustainability research. The general features possessed by these both general and specific fields of research in terms of research paradigms, theoretical approaches, methodologies, topics and research issues can obviously be connected with the need to develop quality research in the field of TE for sustainability.

In a nutshell, research on TE for sustainability can include both empirical and theoretical studies since its disciplinary background can be traced in the natural sciences, the social sciences as well as the humanities. Such research should not try to find the single most appropriate method, but rather select the mode of inquiry relevant to the research problem and research questions; therefore, both qualitative, quantitative and mixed methods approaches are possible. The novel theoretical and methodological approaches (e.g., design research or complexity theory) should, however, be applied not as an end in itself but as an option for successfully dealing with the prevailing contradictions and challenges in the field of sustainability research. In terms of research genres, the research on the effects of TE research for sustainability, for instance, can be applied so as to create and assess the reorientation of TE programmes toward sustainability. Interpretative research would help to reveal the complexity and build a theory about different aspects of TE for sustainability in their contextual variations, attaining best and worst cases in terms of local meaning. Participant research, mainly in the form of action research, would provide the possibility to improve the local practice of TE oriented toward sustainability within a local context and contribute to the puzzle of the global context of TE for sustainability. In relation to design research, a research team of teacher educators, for example, would design and enact an educational environment for future teachers supporting the development of ESD competences and explore their development in this environment.

Research in TE for sustainability needs more multi-disciplinary and multi-methodological approaches, and profound multi-institutional studies. In addition, larger-scale comparative studies providing system-wide and policy-oriented evidence, although hard to conduct, would be necessary to develop the field. It is self-evident that to disseminate research in TE for sustainability in any genre and research paradigm, the report must be written in line with the requirements for rigorous scientific contributions, considering the requirements for structure, content, etc. Furthermore, the reviewers of articles on TE for sustainability have to consider and carefully deal with the diversity of research coming from different parts of the world caused by the distinct cultural and historical background and institutional discourse.

Researchers working in the field of TE for sustainability should carefully follow the latest events in terms of the conceptual development of ESD/sustainability, recent
discussions on educational theories and philosophical approaches in education, and try to overcome the anthropocentric bias, avoiding implicit attempts at political indoctrination and post-political thinking.

The analysis of JTEFS will show whether the published articles in terms of their research approach match the highest attainments and latest trends in the mentioned research fields, and also how the said issues have been dealt with.

Researching Research: A Methodological Explanation

This section of the paper advances the methodological explanation of the presented research focusing on the features of quantitative and qualitative bibliometric study and outlining certain similarities with the literature review method.

Bibliometrics involves a document-related process and, in general, provides the quantitative characterization of scientific activity (Regolini & Jannes-Ober, 2013; Wright & Pullen, 2007). Initially, the subject of bibliometrics was introduced by Pritchard (1969) as “the application of mathematical and statistical methods to books and other media” (p. 349); however, today we can also see several studies with markedly qualitative analysis in terms of research topics, philosophy and methodology under the title of bibliometric studies (Kevin, Zainab, & Anuar, 2009). Bibliometrics can be applied to many elements of scientific activities – single journals, groups of journals with a similar thematic orientation, websites, databases, scientific publications in a specific time slot from a single country and so on.

In our case, we will adapt the methodology of bibliometrics to the analysis of a single periodical in the emerging research field of TE for sustainability. According to Thanuskodi (2010), scientific periodicals serve as a primary source for recent research findings, new trends and current developments in any scientific discipline. He asserts that information is one of the most important resources for a nation and forms the integral base for the economic, cultural and scientific development of the country as a whole and periodicals are the main carriers of nascent thought and information. (Thanuskodi, 2010, p. 78)

The bibliometric study of a single journal can create a valid portrait of the periodical and provide a detailed multi-faceted picture of the characteristics of the journal (Nebelong-Bonnevie & Frandsen, 2006).

The inspection of the literature shows that the bibliometric analysis of single periodicals is quite frequent in the field of reflective meta-studies, and helps provide a critical overview of the situation in a given field (see, for instance, Crawley-Low, 2006; Govindaradjou & John, 2014; Minas, Wright, Zhao, & Kakuma, 2014; Petrina, 1998; Regolini & Jannes-Ober, 2013; Thanuskodi, 2010, 2011, etc.).

The authors have found several variables included in bibliometric studies that can be used to understand the characteristics of a journal, which in turn may reflect the features of the literature and communication behaviour in the fields they represent. Most often they are connected with the authors of the paper, the place of publication, titles, the length of publications, keywords, subject coverage, use of words and phrases in text, citation analysis, etc. (Kevin, Zainab, & Anuar, 2009; Regolini & Jannes-Ober, 2013; Thanuskodi, 2010, 2011; Wright & Pullen, 2007). Analysing 82 bibliometric studies, Kevin, Zainab and Anuar (2009) discerned the following bibliometric measures
used in different studies: article productivity (number of articles per issue, volumes and years indicating trendlines), author characteristics (gender, profession, rank, academic title, geographical affiliations by institution and institution type, region, country), authors’ productivity (rank list of core and active authors), co-authorship patterns (types of co-authored works, degree of cooperation, local and foreign collaboration activities, etc.), content of papers (subject areas, keyword and title analysis, number of pages per article, types of research methodology and types of models and theories).

This paper is the first review in relation to JTEFS that was established only 13 years ago, and it is also among the few analytical reviews of single journals publishing research on sustainability in connection with education. The most familiar and globally recognized journals in this field are the International Journal of Sustainability in Higher Education, Journal of Education for Sustainable Development, Sustainability: The Journal of Record, The Journal of Sustainability Education and others. According to Barth and Rieckmann (2013), just a few comprehensive reviews on research in a field of ESD have been made, and only some of these have reviewed a single journal in this field to cover one specific research area.

In 2006, on the occasion of the tenth anniversary of Environmental Education Research, Reid and Scott already critically discuss the plans for the DESD using the bibliometric approach (Reid & Scott, 2006). However, it seems that the earliest review in the field of ESD was conducted by Wright and Pullen (2007), who conducted a bibliometric study of ESD journal articles in the ERIC database between 1990 and 2005. In a publication dated the same year, research trends in the US highlighting the movement from environmental education to ESD were analysed (Heimlich, 2007). A couple of years later Wals and Blewit (2010) analysed the thematic focus of the first nine years (2001–2010) of the International Journal of Sustainability in Higher Education. Vaughter et al. (Vaughter, Wright, McKenzie, & Lidstone, 2013) provided an exhaustive review of educational research on sustainability in post-secondary education within eight leading international journals publishing on sustainability and education. As already mentioned, Barth and Rieckmann (2013) presented a conference paper reviewing research in HE for SD based on an international literature review (1992–2012) analysing 509 articles in 110 journals. In addition, Barth and Michelsen have also conducted a bibliometric analysis focusing on the connection between educational and sustainability science (Barth & Michelsen, 2013).

As this paper will also target the knowledge gaps and research advances as well as try to identify emerging trends and controversies in research in TE for sustainability, one can assume that it contains some features not only from quantitative and qualitative bibliometric analysis, but also in terms of a literature review. Precisely as in a literature review, the authors will describe, synthesise and critically evaluate the research in relation to the problem under investigation. However, the difference is in the scope of the sources because in our case we will focus only on papers from a single journal. The features of the integrative review in this paper will allow us to provide new frameworks and perspectives on the topic, while the discourse of the historical review will appear in the analysis of developmental changes in JTEFS and showing the likely directions for future research. Undoubtedly, significant focus in this paper will also be on the methodological review, where the authors will deal with the underlying theories, research approaches, data collection and analysis (Fink, 2009; Petticrew & Roberts, 2009).
To describe the data analysis methods for this research, we should indicate that primarily quantitative bibliometric data was extracted and summarized by simple counting or labelling procedures while making inferences about the frequency of variables. This relates to the indicators of impact, databases, number of contributions per issue, representation of countries, institutions and authors, co-authorship patterns, number of references, citation rate, keywords, sample, data collection and analysis methods. In order to analyse the research paradigms, discerning the philosophical background of the studies, groups of keywords, research topics and some methodological features (research type, genre, orientation), both deductive and inductive coding approaches to textual data were applied as needed. To distinguish the groups of keywords and research topics, the inductive coding was performed, using semantic features from the title, keywords, abstract and main part of each paper, and analysing them in light of expert knowledge and academic experience in the field of TE for sustainability. To interpret the philosophical background (holistic theory, complexity theory, anthropocentric/non-anthropocentric divide), research type (empirical/theoretical, qualitative/quantitative/mixed method research), genre (effect/interpretative/participative/design research) and orientation (quantitative, qualitative, theoretical, participative orientation) reflected in journal articles, deductive coding based on the theoretical approaches described in the beginning of paper was involved.

Accordingly, we will analyse the bibliometric variables within a single periodical, covering all five areas discerned by Kevin, Zainab and Anuar (2009). The first chapter of the Results section will cover the indicators of impact, databases, number of contributions per issue, representation of countries, institutions and authors, co-authorship patterns, number of references and citation rate. The second chapter will elucidate on the research paradigms within the sample of journal papers, namely, the philosophical background of studies, keywords and research topics, and methodological features (research type, genre, orientation, sample, data collection and analysis). The bibliographic variables were chosen because of their relevance to the status, context and history of JTEFS – established in specific circumstances and with an exclusive mission for this very recent field of scientific studies. Therefore, the aim of this study is to explore the research output performance published in JTEFS during the last decade focusing on quantitative and qualitative bibliometric indicators and the research paradigms used. The following research questions will be answered in the subsequent analysis: 1) What are the main bibliometric indicators of JTEFS (2005–2014)? 2) What are the distinctive elements of the research paradigms used in the papers published by JTEFS (2005–2014)? and 3) What developmental changes can be traced behind the main bibliometric indicators and research paradigms within the papers published in JTEFS (2005–2014)?

Study Sample

The present study includes the articles, their authors and affiliation, abstracts, keywords and references at the end of each article, published in JTEFS from 2005 to 2014. The data pertaining to JTEFS includes 138 articles starting from volume 5 in 2005 to volume 16 in 2014. The first seven volumes out of the 18 volumes of JTEFS analysed in this study were published under the guidance of Anita Pipere as editor-in-chief, while the last 11 volumes appeared thanks to the leadership of Astrida Skrinda in this position.
Results

Main Bibliometric Indicators (JTEFS 2005–2014)

**Impact and databases.** Currently, the SCImago Journal Rank for the journal is 0.217, SNIP – 0.256, Impact per Publication – 0.222 (data from 2014). The journal is included in the following database: Cabell’s Directory, CABI – CAB Abstracts, CEJSH (The Central European Journal of Social Sciences and Humanities), Celdes, CNKI Scholar (China National Knowledge Infrastructure), CNPIEC, EBSCO – TOC Premier, EBSCO Discovery Service, Educational Research Abstracts Online, Elsevier – SCOPUS, ERIH PLUS, Google Scholar, J-Gate, JournalTOCs, Naviga (Softweco), Primo Central (ExLibris), ProQuest (relevant databases), ReadCube, SCImago (SJR), Summon (Serials Solutions/ProQuest), TDOne (TDNet), Ulrich’s Periodicals Directory/ulrichsweb, Wiley – Higher Education Abstracts and WorldCat (OCLC). The JTEFS is the only journal in Latvia in the area of education included in SCOPUS.

**Representation of countries, institutions and authors.** The journal has two issues per year. The number of articles per volume in the target decade ranged from 6 to 10 articles – 7.7 articles on average per volume. The papers for JTEFS have been received from 26 countries across the world, representing all five continents. However, the distribution of papers among the countries has been rather imbalanced. Five countries have provided about 50% of the total published articles (Latvia – 28.3%, Estonia – 18.8%, Finland – 8%, USA – 8%, Greece – 6.5%). However, only 3.6% of the articles have been authored by scholars from different countries designating the cross-country authorship, many more have been created via the collaboration of different institutions within a single country.

The leading institution with 24.6% of publications in JTEFS from 2005 to 2014 was Daugavpils University, though this is not surprising since the journal has been established, managed and led from this university. Tallinn University as a close partner of Daugavpils University in BBCC has also been extensively represented with 18.1% of publications in this journal. Several publications also came from such institutions as the University of Helsinki (4.3%), University of Malta (4.3%), University of Crete (3.6%), University of Eastern Finland (3%). The names of the leading authors also match the list of leading universities: D. Iliško (Daugavpils University) tops this list with 6 articles (authored and co-authored), following by K. Lukk (5 articles) from Tallinn University, 4 articles have been published by I. Salite, L. Jonāne, I. Mičule from Daugavpils University, M. Veisson from Tallinn University and V. Makrakis from the University of Crete.

From 138 articles, 59.4% were written or co-authored by men that suggests a rather balanced gender distribution in this field of educational research. Just under forty per cent (39.9%) of the articles were written by a single author, other papers were authored by two to six authors – two authors being the average number of authors per paper. Among the main authors of papers, 31.9% were PhD students.

**Number of references and citation rate.** Average number of references per article is 30.5 references ranging from 7 to 105 references. Authors have cited articles from JTEFS 93 times, on average 5.2 times per volume. Two volumes do not contain any citations from JTEFS, while one volume contain 18 citations from this journal.

The largest citation rate in SCOPUS (6 times each) during the examined period was received by two articles from JTEFS: “Educational action research for sustainability:
Constructing a vision for the future in teacher education” by Salite (2008) and “Educational action research for sustainability: Seeking wisdom of insight in teacher education” by Salite, Gedžiūne and Gedžiūne (2009). In total, starting from 2006, 24.6% of articles from JTEFS were cited in SCOPUS at least once.

Research Paradigms (JTEFS 2005–2014)

**Philosophical background of studies.** Close exploration of the content of the articles indicates that almost every author mentions some philosophical concepts or theory. However, not all of them elaborate on this philosophical discourse. The analysis of the papers proves that 34 (25%) papers comprise more or less a pronounced integration of philosophical concepts, theories and approaches. Later, we will provide more detailed analysis in terms of holistic theory – a precursor of complexity theory, complexity theory itself as well as the anthropocentric/non-anthropocentric divide – the most frequent philosophical trends noticed in JTEFS (2005–2014).

Nineteen (13.8%) of the papers were found to refer to holistic theory, the concept of holism or holistic principles or strategies in some way. To provide some examples, Iliško (2005) explains the connection between holism and education and asks teachers to evaluate their orientation toward the idea of a holistic curriculum; Armstrong and LeHew (2011) apply holistic principles in order to transform the university course *Private Label Apparel Product Development* toward sustainability; Badjanova (2013) uses a holistic approach to facilitate the acquisition of musical cultural values among primary school students. Interestingly enough, 13 papers embracing holism belong to authors from the Baltic states.

The articles integrating complexity discourse were mostly theoretical. Seven articles integrated complexity theory starting from a simple mention of complexity to a rather extended description of an incorporated principle or strategy of complexity. In two articles complexity theory was just referred to, while in another two publications the authors have used complexity theory as one of the key background theories in their theoretical work – to explain knowledge systems for SD and sustainability (Wensing & Torre, 2009), and to foster an ontological shift in perceptions of reality through weaving rhizomatic principles with the processes of ESD (Tillmanns, Holland, Lorenzi, & McDonagh, 2014). Three other articles can be viewed as impinging on several complexity principles and strategies: interdiscursivity through weaving together the topics of water and justice (Dimenäs & Alexandersson, 2012), self-organisation depicting the emergence of a sustainability plan at a large US college (Smith, 2011), and perceptions of the school environment through the nesting of several systems (Katane, 2007).

It should be noted that some other philosophical trends or authors were also alluded to in some articles, for instance, humanistic philosophy (Kuurme, 2008), Heidegger (Iliško, 2007), Blondel (Mandolini, 2007), Levinas (Holland, Mulcahy, Besong, & Judge, 2012) and others.

It was found that ten articles contain explicit reference to the anthropocentric/non-anthropocentric divide or critique of anthropocentrism. These were all theoretical papers or papers containing case studies or qualitative methodology. The divide between anthropocentric/non-anthropocentric approaches was used in articles by Salite, Gedžiūne and Gedžiūne (2009), Kostoulas-Makrakis (2010), Gedžiūne and Gedžiūne (2011), and Buttigieg
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and Pace (2013) – these authors used this divide mainly to evaluate the views of research participants. The critique of anthropocentrism was oriented mostly toward normative definitions and approaches in the field of sustainability (Bentham, 2013; Cutanda & Murga-Menoyo, 2014; Eriksen, 2013; Mandolini, 2007; Pipere & Mičule, 2014; Smith, 2011).

**Content of papers: keywords and topics.** The keywords and topics of JTEFS papers (2005–2014) will be analysed both from a qualitative and quantitative point of view. In total, 138 articles contained 619 keywords. The largest group of keywords (n = 107) was constituted by different terms in relation to cognitive activities, teaching/learning processes and individual features of students and teaching. This group contained keywords in such fields as learning (n = 16) (e.g., e-learning, online, transformative, meaningful, lifelong, language, cooperative, self-directed, social-constructive, blended, problem-based, mutual learning), evaluation/assessment (n = 8), learning/educational environment (n = 7), thinking (n = 5) (e.g., dialectic, critical, systemic ecological, complex thinking), reflection (n = 4), knowledge (n = 3), and frame of reference (n = 2). Three large groups of keywords standing out in this category are “competence” (n = 16), “curriculum” (n = 13) and “creativity” (n = 7).

Out of 619, 87 keywords in general retain the concepts of teacher, teacher education/training/preparation, teachers’ professional development and teaching activities. All together, the keywords regarding “teacher/s (including some specifications)” were used 28 times, while “teacher education/training/preparation” sometimes applied either to pre-service or in-service teachers were used 27 times.

The keywords regarding teachers’ professional development (n = 17) were also represented (e.g., teachers’ competence (2), teacher professional learning, teachers’ beliefs, teachers’ Standard of Professional competence, teachers’ roles, teachers’ voice, teachers’ evaluation, teacher development, head-teacher–teacher relationship, co-teaching in teacher education, mentoring in teacher education, collaborative teaching in teacher education, teacher-carried research, teachers’ personal and professional growth, teachers’ autonomy, student teachers’ identity). The following keywords depict teaching practice – “teaching” (3), “teaching/pedagogical practice” (2), “teaching of mathematics”, “train-the-trainer”, “reflective teaching”, “teaching methodology”, “teaching process”, “instructional practices” and “teaching methods”. Some other keywords attuned to this group were “teacher education programs” (2) and “adult educator”.

The other large group – 83 keywords, were words or phrases containing the terms “sustainable” or “sustainability”. The keyword “sustainable development” was used 20 times, while “sustainability” was mentioned 11 times. To show the connection between education and sustainability, 23 articles contained the keyword “education for sustainable development”, and such phrases as “sustainable education” (2), “education for sustainability” (2), “teacher education for sustainability”, “sustainability pedagogy”, “pedagogical model for sustainable development”, “educational unsustainability” and “sustainability literacy” were also observed among the keywords.

Furthermore, some other connections with sustainability were displayed in keywords such as “sustainable leadership (skills, abilities)” (3), “sustainable changes” (2), “sustainable communities”, “sustainable community of practice”, “sustainable human development”, “sustainable energy”, “sustainability plan”, “sustainability perspective”, “environmental sustainability”, “sustainable school indicators”, “sustainable school”, “sustainable
behaviours”, “sustainability competences”, “sustainable design”, “features of sustainability” and “features of unsustainability”.

The next largest group of keywords (n = 67) relates to education, among them several groups of concepts pertaining to the type and level of education were found (e.g., preschool education (9), higher education (5), primary education (5), education (3), further education (2), secondary education (2), general education (2), non-formal education (1)). Other keywords manifested different content areas of education (e.g., environmental education (9), climate change education (2), energy education (2), holistic education (2), art education (2), natural science (2), civic, science, special, performative, health, practical, technology, career, vocational, multilingual, future, entrepreneurship, multicultural, cross-cultural, inclusive, physical education). Also, such keywords as “diversity in education”, “education policies”, “higher education institution” and “change in educational paradigm” can be attributed to this group.

The group of keywords illustrating the research performed in the papers is smaller (n = 24). The largest number (7) is connected with action research: “educational action research” (4), “action research” (2) and “participatory action research” (1). In general, all other keywords that related to research methodology illustrated elements connected with qualitative research, including “narrative (inquiry)” (3), “qualitative research”, “photo-interview”, “lesson observation”, “journal keeping”, “reflective writing”, “SWOT analysis”, “case study”, “design-based research”, “interpretative phenomenological analysis”, “content analysis”, “representation”, “concept mapping” and “questionnaire”. Just one keyword (“correlation”) can be associated to quantitative research.

Other keywords represented the large array of smaller groups of concepts in connection with different educational stakeholders and their actions, elements of teaching/learning approaches and theories.

Now let us turn to the other features of articles characterizing their essential content – the topics of papers. The largest group of papers, which can be easily divided in three subgroups, relates to the various school subjects and areas (32 or 23.2%): 12 papers were connected with the area of environment, science, mathematics, technology; 10 papers dealt with the popular trend of ICT for ESD, while another 10 papers demonstrated the connection between ESD and teaching/learning in art, music, physical education, health education, foreign language and native language acquisition. This group can be illustrated by the papers “Interdisciplinary mathematics and science education through robotics technology: Its potential for ESD (a case study from the USA)” (Gerrretson, Howes, Campbell, & Thompson, 2008) and “The Finnish five-string kantele: Sustainably designed for musical joy” (Ruokonen, Sepp, Moilanen, Autio, & Ruismaki, 2014).

Authors of JTEFS often went in for topics connected with the professional development of pre-service/in-service teachers and their views on different issues in education and ESD (27 or 19.6% papers). This group of papers can be represented by the papers by Nurmilaakso (2009) “Preschool and primary school children as learners in ESD: Views of Finnish student teachers” and Manolas and Tampakis (2010) “Environmental responsibility: Teachers’ views”.

A further topic that was studied quite often was school/educational environment, its issues and connection with ESD (23 or 16.7% papers). This group is well represented by the papers “Parental involvement in the framework of holistic education” (Lukk,
Theoretical issues and research in pre-service/in-service teacher education for ESD were dealt with in 18 papers (13%); for instance, “Developing and applying a critical and transformative model to address ESD in teacher education” (Kostoulas-Makrakis, 2010) and “Effecting change through learning networks: The experience of the UK teacher education network for ESD and global citizenship” (Inman, Mackay, Rogers, & Wade, 2010).

Nine papers (6.5%) interpreted preschool education theory and practice, while seven articles (5.1%) analysed methods, materials and resources for EE and ESD. These two categories can be illustrated by Härkönen’s (2009) “Pedagogical systems theory and model for sustainable human development in early childhood education and care” and the paper by Vanheer and Pacé (2008) “Integrating knowledge, feelings and action: Using Vee heuristics and concept mapping in education for sustainable development”.

Several contributions were devoted to the development of curriculum (6) and teachers’ induction, mentoring and pedagogical practice (5). These topic groups can be exemplified by the papers “Course curricular design and development of the M.Sc. programme in the field of ICT in ESD” (Makrakis & Kostoulas-Makrakis, 2012) and “Developing reflective practice in the classroom: A case study of ten newly qualified teachers during their year of induction” (Jones, 2005).

For 10 articles (7.2%), it was hard to identify their topic as belonging to some content category mentioned above as they covered areas only marginally connected with TE for sustainability. It should be mentioned, that some papers contained several (at least two) content areas by which they could be included in one or another topic group.

Methodological features. The methodological features of the papers will be described in the following order: we will start with the characteristics of research type, then use classifications by research genre (Borko et al., 2007) and the model of agentive perspective (Reunamo & Pipere, 2011), and finally we will turn to the features of samples and methods of data collection and analysis.

The majority of the articles (99 or 71.7%) represented some type of empirical research, 11.6% of papers contained both innovative theoretical elaborations and empirical research, while 16.7% of papers comprised theoretical interpretations of different topics. In terms of methodological preferences in empirical studies, qualitative research was represented more than others (35.5% of papers), following by quantitative studies (28.3% papers) and mixed methods research designs (16.7% papers). In the case of 3% of empirical papers, their methodological affiliation was hard to identify. Out of all the empirical papers, 10.9% contained the diverse interpretations of project evaluations, while only 3.6% could be called comparative studies (e.g., Keinonen et al., 2014; Rohwedder & Virtanen, 2009; Vartiainen & Enkenberg, 2013).

The analysis of empirical papers in terms of belonging to one or another research genre was not easy, since quite a number of authors did not especially elaborate and accurately reveal the genre while describing the methodological features of their study. The largest group of empirical papers in JTEFS (2005–2014) can be attributed to the interpretative research genre (26.1% of papers). As examples of this genre, we can mention the papers “Sustainable education and socialization through mistakes” (Leino, 2007) and “Mathematical identity for a sustainable future: An interpretative phenomeno-
logical analysis” (Pipere & Mičule, 2014). The next largest group of 25 (18.1%) articles was classified as belonging to the participative research genre. This group can be illustrated by the papers “Educational action research for sustainability: Seeking wisdom of insight in teacher education” (Salite, Gedžūne, & Gedžūne, 2009) and “Developing a sustainability plan at a large U.S. College of education” (Smith, 2011). The smaller group, consisting of 14 (10.1%) papers, was allocated as design research devoted to the development and testing of appropriate educational environments. As good examples for this group, we can name the papers “Qualitative education for Roma students: A pedagogical model for sustainable development” (Zakė, 2010) and “Educative experience of the use of concept mapping in science and environmental teacher training programmes” (Pontes-Pedrajas & Varo-Martínez, 2014). The smallest group was effect research, only represented by 11 (8%) papers. For instance, Jon‘ne (2008) in her paper “The didactical aspects of integrated natural science content model for secondary school education” uses the quasi-experiment to prove the effect of an integrated science content model on pupil achievement, while Ficarra and Quinn (2014) in their paper “Teachers’ facility with evidence-based classroom management practices: An investigation of teachers’ preparation programmes and in-service conditions” look for the correlation between teacher knowledge and competency ratings for evidence-based practices. Thirty (21.7%) papers were left outside of this type of classification as they did not correspond to the general descriptions of genres (Borko et al., 2007). These papers mostly contained quantitative descriptive research using percentage, descriptive statistics and group differences.

The application of the model of agentive perspective (Reunamo & Pipere, 2011) in the papers under analysis showed the heterogeneity of the studies, as many of them contained features of not just one, but also two or three orientations of this model. However, this mode of classification made it possible to categorize all empirical articles without exemption. The largest three groups were studies with quantitative (27 or 19.6%), theoretical (22 or 15.9%), and qualitative/participative (22 or 15.9%) orientations followed by two smaller groups of qualitative (15 or 10.9%) and qualitative/quantitative/participative (13 or 9.4%) orientations. In the group with the least frequent orientations overall, qualitative/quantitative research is the most frequent (9 or 6.5%), followed by theoretical/qualitative (6 or 4.3%), theoretical/quantitative (6 or 4.3%) and theoretical/qualitative/participative (6 or 4.3%) research. Just a few studies represented quantitative/participative (4 or 2.9%), participative (3 or 2.2%), theoretical/participative (3 or 2.2%) and theoretical/quantitative/participative (2 or 1.4%) studies.

In general, according to Reunamo’s four-fold model of ESD research (Reunamo & Pipere, 2011), the focus on the subject’s content and teaching approaches is aligned solely with an assimilative orientation of the model, using mostly theoretical and quantitative points of view (e.g., Jon‘ne, 2008; Šapkova, 2011) while an accommodative stance on understanding the motifs and discourse of SD as meta-content or meta-message could be found in qualitative research of individual participant interactive processes (e.g., Pipere & Mičule, 2014; Raus & Falkenberg, 2014; Gedžūne, & Gedžūne, 2011, etc.).

Looking at the research samples usually says a lot about the focus of the study, all together, 13 different populations were engaged in the studies – in-service teachers, pre-service teachers, pupils K–12, university students, parents, youth, adult educators, teacher educators, university staff, university graduates, mentors, principals and experts. The largest number of papers dealt with in-service teachers (37 or 26.8% of papers), which
is perfectly understandable given the title and policy of JTEFS, the next largest group was pre-service teachers (17 or 12.3% of papers), then pupils K–12 (15 or 10.9% of papers) and university students (10 or 7.2% of papers). Twenty one (15.2%) papers contained an empirical study based on mixed samples, for instance, in-service and pre-service teachers, in-service teachers and primary school students, or pre-service teachers, mentors and teacher educators.

As the descriptive statistical analysis shows, the largest samples were used for quantitative studies with a range from 11 to 7,134 participants ($M = 948.16; SD = 1972.29; Mdn = 198$). The smaller samples were encountered in mixed methods research papers. They ranged from 16 to 1,055 participants ($M = 190.32; SD = 220.96; Mdn = 121.5$). In concordance with accepted rules and research tradition, the smallest samples were engaged in qualitative research involving from 1 up to 1392 participants ($M = 80.23; SD = 216.29; Mdn = 24$). Just a few authors have described their sampling approach, although, it can be assumed that, in general, all qualitative studies used purposeful research sample. As for the quantitative and mixed methods research, the authors mostly used non-probability sampling: most often they collected data from convenience samples, much less often – from purposeful samples. Only three papers contained mention of random sampling, and one paper contained the description of a study using a stratified sample.

Turning to the data collection design and method, the analysis of papers showed that about half of the empirical papers contained one research method (53.4%), two research methods were employed in 22.6% of papers, three research methods were used in 9.6% of papers, while four research methods in only 6.1% of papers. However, it should be noticed that for 8.3% of papers, the research method was not discernible or the authors just mentioned the research design, in these instances primarily case study. In regard to research designs, as has become popular in ESD research, a notable number of authors resorted to case studies (13.9%) and action research (7%). Ethnography, grounded theory research and experimental designs were used just in a couple of the studies. In regard to the frequency of the administered data collection methods, the methods will be categorized according to the distribution of data collection methods in the review by Barth and Rieckmann (2013) so as to make the subsequent comparison possible. Since about half of the studies contained several data collection methods, we will reflect the distribution of the methods using the natural numbers of the papers where such a method was used. Hence, surveys were the largest group of methods (73 or 52.9% of papers), followed by interviews (32 or 23.2%). Tests/assignments (16 or 11.6%) and focus groups (14 or 10.1%) were used less. Only 10 (7.2%) papers contained document analysis, while observation was applied in just 8 (5.8%) papers. Eleven (8%) papers described the use of other data collection methods (e.g., writing essays, written narratives, narrative story telling, analysis of reflective journals of students, researcher’s field notes, SWOT, artefacts).

In regard to the data analysis methods, these will be divided by methods for analysing qualitative and quantitative data, and their frequency will also be reflected in natural numbers. In papers using qualitative data (72 or 52.2% in total), the two prevalent methods were qualitative content analysis (36 or 26.1% of papers) followed by thematic data analysis (15 or 10.9%). Other methods were employed very rarely (e.g., phenomenological analysis (3), discourse analysis (2), narrative analysis, continuous comparative
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In terms of a combination of qualitative data analysis methods, the majority of qualitative or mixed method research papers included just one qualitative data analysis method. It was observed that a large number of authors did not describe their specific qualitative data analysis method, rather merely indicating their use of qualitative data analysis. In addition, a small number of authors inserted references to scholarly sources when describing their qualitative data analysis method.

About half of the papers dealing with quantitative data (62 or 44.9% in total) comprised the calculation of the percentage of obtained categories of answers, scores, and so on (29 or 21% of papers); in such papers, usually only one approach to data analysis (percentage calculation) was applied. However, a statistical analysis was also performed in some of quantitative or mixed method research papers using descriptive statistics (means (17 or 12.3%), frequency distribution (11 or 8%), correlation (5 or 3.6%), Chi-square (4 or 2.9%)) and inferential statistics (Student t-criteria/Mann-Whitney criteria (18 or 13%), ANOVA/Kruscall-Wallis test (10 or 7.2%), factor analysis (4 or 2.9%), cluster analysis (3 or 2.2%), regression analysis (2 or 1.4%)). In papers with statistical analysis, several statistical data analysis procedures were usually applied to the quantitative data.

The Main Bibliometric Indicators and Research Paradigms (JTEFS 2005–2014):
Developmental Changes

Looking at one of the most important bibliometric indicators of the journal – inclusion in international databases – shows that in 2007 JTEFS was included in CABI - CABI Abstracts and SCOPUS (Elsevier Bibliographical Databases), then in 2009, agreement with De Gruyter Open (formerly VERSITA) regarding the electronic open access to journal papers ensured the further inclusion of JTEFS in other databases and services (like EBSCO, ERIH, etc.). From its establishment in 2002 until 2007, the journal only had one issue per year, but starting from 2008 there were two issues per year. The change of title from the Journal of Teacher Education and Training in 2002 to Journal of Teacher Education for Sustainability in 2007 designated a more tenable demand for the specific content of the papers; however, it should be noticed that the change of title did not send the topics and content of the journal papers in an entirely new direction. From its inception in 2002, the main unifying platform for research was already sustainability or ESD in regard to TE, even if the concepts were not always explicitly described or sustainability was not mentioned as the theoretical platform or measured as a variable.

In the period from 2005 to 2010, papers from Latvia and Estonia dominated the journal, but from 2011, the share of these countries started to decrease and the number of papers from other countries clearly increased. While the first part of this period evidenced a lack of cross-country authorship, the last years show the gradual increase of such papers. In terms of contributions by doctoral students, we can see a slight decrease – from 2005 to 2008 on average 3.3 papers per volume were by doctoral students, while from 2009 to 2014 on average only 2 papers per volume were by doctoral students.

We will now turn to the development of research paradigms in the suggested period. At the beginning (2005 and 2006), about 50% of the papers included holistic approaches, then from 2007 to 2009 only one paper contributed to holistic discourse, and from
2010, holistic theory experienced a revival with two authors using this approach each year. The majority of these are empirical papers with a qualitative orientation, although some articles also employed quantitative or mixed method approaches, and a few were theoretical papers. About half of these papers pertaining to the holistic approach were created by Latvian authors.

The application of complexity theory was not consistent either – in the beginning of the period its use was rather uneven (no reference to such a theory in 2005, 2006, 2008 or 2010), but from 2011 at least one paper per year contains references to this theoretical discourse. The majority of these articles are theoretical contributions or theoretical discussions with a trace of an empirical disposition.

The implementation of a critique of anthropocentrism shows steady growth from 2007. In 2013, three papers already featured both a critique of anthropocentrism and an exploration of the anthropocentrism/non-anthropocentrism divide. As with papers involving complexity theory, these papers are theoretical or clear representatives of the interpretative genre.

Our analysis of the development of JTEFS in terms of research topics does not indicate any pronounced trends; all 8 topics are distributed throughout the period rather evenly. However, several clusters of topics can be observed in different sub-periods; for example, clusters on the topic of various school subjects and areas – 6 articles in Vol. 13, 2011 and 4 articles in Vol. 16, 2014; or professional development of teachers and their views on education and ESD – 5 articles in Vol. 6, 2006 and 5 articles in Vol. 16, 2014. Clusters of articles were also identified on the topics of curriculum development – 4 articles in Vol. 14, 2012 and issues of school/educational environment and connection with ESD – 4 articles in Vol. 5, 2005.

The analysis of the development of methodological approaches did not show any peculiar trends or increase; the distribution of different approaches from 2005 to 2014 can be described as a slight undulation of mixed and theoretical research with some larger waves of quantitative exploration on a steady surface of qualitative studies. Only two exceptions were noticed – a volume with 6 quantitative studies in 2005, and 6 theoretical studies in Vol. 14 in 2012.

A wide diversity appears in terms of research genre: in regard to qualitatively oriented genres one could say that both interpretative and participative genres are rather evenly distributed during the studied period; although, the interpretative genre is completely missing in 4 volumes, while the participative genre was not found in 6 volumes. However, the patterns differ, showing some depression in the middle of the period for the interpretative genre and an upswing for the participative genre in precisely this same period. Effect research was found to be rather evenly dispersed through the whole period, while for design studies the period of greater activity was observed in 2009–2010.

The description of research development in accordance with the agentive model (Reunamo & Pipere, 2011) starts by noticing the continuous presence of “pure” quantitative research during the whole period from 2005 to 2014 (with the exception of three volumes towards the end of this period). The numbers of theoretical research rises towards the end of the studied period. While “pure” qualitative research dominates in the first half of the period, the second half stands out for the noticeable growth of mixed method research including different combinations of qualitative, quantitative and participative orientations. The combination of a theoretical stance with other orientations emerges both in the beginning of reviewed period and re-enters again from 2011.
In regard to data collection methods, the most popular methods of survey and interview appear rather evenly during the whole period under analysis, with the only exception being that interviews are missing in Vol.11, 2009.

No specific developmental trends were found in terms of the sample volume or type of population – these variables were primarily connected to research methodology or genre; the only noticeable factor was very large samples sometimes used by Estonian authors in their quantitative research papers.

In terms of data analysis methods, only 2011 and 2012 show a lack of thematic analysis as a data analysis method for qualitative data, all other volumes represent one or two papers with the application of this method. The use of content analysis was observed in each volume during the studied period, with the greatest incidence being (4 papers per volume) in Vol. 13, 2011 and Vol. 16, 2014. Statistical data analysis was utilized unevenly during the studied period, and was totally missing in three volumes: Vol. 8, 2007, Vol.11, 2009, and Vol. 14, 2012, while in other periods, the number of studies using statistical analysis of quantitative data varied between one and three papers per volume.

Discussion and Conclusions

This chapter will be structured in line with the research questions and framework of the results section, simultaneously echoing the criteria and qualities challenging research in TE for sustainability reflected at the beginning of the paper.

Main Bibliometric Indicators (JTEFS 2005–2014)

The description of bibliometric indicators for JTEFS is not an end in itself, as they can help illustrate changes, and feature both the successes and difficulties of the research.

In comparison to other journals exploring a similar topic, the representation of JTEFS in databases has been quite successful and, although inclusion in SSCI is yet to be achieved, the indicators of the journal’s ranking and impact have improved and show the clear development of the journal’s quality. However, the rate of article citation in SCOPUS has to be improved, although this is hard to do in such a narrow research area. Admittedly, this coverage cannot compete with other journals on TE published in Western countries with completely different levels of resources and lengths of experience, and besides, this method of evaluating scientific activity favours publications established in Anglo-Saxon countries (Archambault & Vignola-Gagné, 2004). As professional experience shows, even if included in reputed databases, journals from Eastern Europe will have lower prestige and consequently lower citation rate and international ranking. Besides, the authors have observed a more or less conscious citation bias towards authors from Anglo-Saxon countries. Although, the citation rate and similar indicators currently have very high support from Latvian political decision-makers in education and research, who believe that evaluations based on these measures could help boost the competitive capacity of Latvian scholars on a global scale, this approach overlooks at least two arguments: first, the idea that with the present system of publication, research promotion and grant distribution, scholars in the natural sciences will automatically reach the higher scores; and second, such measures of research quality will rather reproduce normative,
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adaptive research instead of facilitating studies with novel and controversial approaches that would be very appropriate for sustainability science.

Therefore, to evaluate the success of JTEFS we have to compare this periodical with periodicals from similar countries and research fields and consider the scientific and educational context and historical background of Latvia as well as the fact that the first international peer-reviewed academic journals in education appeared in the Baltic states only about a decade ago.

With regard to the geographical range of contributions, it should be noticed that the editorial board at JTEFS does not have any bias toward the national affiliation of the authors – the only requirement is the quality of the contribution, although, the national origins of the authors need to be diversified to avoid the dominance of Western countries. In addition, cross-country authorship should be facilitated as it usually enhances the number of comparative studies. The leading universities and authors in terms of numbers of publications in JTEFS have been from the long-term partners of the BBCC and/or other international projects that once again underscore the role of networking in capacity building for sustainability research.

Research Paradigms (JTEFS 2005–2014)

The integration of some philosophical approaches or concepts in about a third of the papers is a self-evident feature, since more than half of the contributions contained some indication of the interpretative paradigm. Qualitative studies usually comprise a stronger emphasis on philosophical approaches than quantitative studies; for example, they are used to explain qualitative designs or interpret qualitative data. The most frequent choice for many authors in respect to their philosophical position has been the holistic philosophy that has been acknowledged as a predecessor of complexity theory (Heylighen, Cilliers, & Gershenson, 2007) and has been rather admissible among educational researchers and studies in teacher education in the last few decades (e.g., Kettley, 2012). The field of environmental education and sustainability education has already tried to expose the explanatory power of this approach. In the case of JTEFS, members of ISE (the organisation that founded JTEFS) focus on holism in their research and practice allowed them to bring this approach into the philosophical vocabulary of the BBCC network and manifest it in many publications within JTEFS. The implementation of complexity discourse in several theoretical papers indicates that this new theory has strong potential for educational research for sustainability that needs to be developed further and enriched with convincing empirical evidence, although it seems that due to some critical moments for this theory, this could take rather a long time. The critique of normative approaches in ESD suggested by several authors (Knutsson, 2013; Kopnina, 2012; Öhman, 2011) is well reflected in articles dealing with anthropocentrism in definitions, conceptions, and views of teachers and learners; however, this approach appears more often in recent papers.

The distribution of the largest groups of keywords and topics can also provide an insight into the content priorities in TE for sustainability research. The interpretation of keyword categories shows the expansion of the semantic emphasis on the epistemological and ontological aspects of teachers’ work regarding the specific features and processes of teaching/learning that designate the essence of teacher and learner. This understanding
is followed by the making of this essence through educational, training and development aspects inherent for this profession as well as specific work activities and the specifics of this journal in terms of sustainability. The field of activities – education and research methodology – is represented at the lowest rate. The powerful dominance of essentially educational entities refutes criticisms (Sund & Lysgaard, 2013) of a loss of focus on educational processes in ESD research; therefore, here we should strive for a sound intermingling of educational and sustainability aims in every research.

Considering the topics of the articles, the dominance of contributions connected with the integration of sustainability in various school subjects and fields obviously attests to the specialization of the authors such as the university teachers or PhD students teaching these subjects or their methodology. Besides, such a diversity of disciplines and areas is already integrated into the journal’s politics and guidelines. Interestingly, the fact that this is also the second most popular topic in the *Journal of Higher Education for Sustainability* (Wals & Blewit, 2010) after the topic of campus greening, shows the gradual spread of sustainability outside the more traditional areas of environmental education and science. The next largest topic related to the professional development and views of teachers relates to the teachers themselves and their perception of sustainability matters. Such topics are also quite popular when embarking on research in any new field in social studies, which needs to identify the real situation and attitudes of actors so as to move forward. A large proportion of the papers related to the educational environment in connection with ESD designates both the holistic research approach as it deals with the context of the studied phenomena and the clear need to explore the state of sustainability in education. In general, the topics covered by the articles in *JTEFS* match the topics discovered in a previous international survey of ESD researchers (Pipere, Reunamo, & Jones, 2010), especially in regard to examining the current situation, changing the awareness of stakeholders in the educational process in regard to sustainability and contextualised educational models. Much fewer studies have been devoted to research into the changing behaviour and lifestyles of student teachers, in-service teachers or school pupils towards more sustainable choices. The integration of ESD into pre-service and in-service TE programmes was evaluated more at the level of local action research than as cross-comparative global studies. Youth involvement in ESD activities was also explored only in a couple of papers. In future, the number of papers only marginally connected with TE for sustainability should be considerably reduced.

In terms of methodological features, the distribution of methodological approaches in *JTEFS* papers in general coincides with the distribution of empirical and theoretical papers in other journals publishing educational research. The small number of theoretical studies can be explained by the fact that they usually address innovative and challenging approaches and concepts that are not so easy for less experienced researchers, teacher trainers or PhD students to develop. The proportions of qualitative, quantitative and mixed method research are quite equal, while comparative research needs considerably more development. However, according to genre classification, the trend toward interpretative and participative research dominates in the papers as a common practice in TE research (BERA, 2014; Tatto, 2013). This is in line with the calls for participative and transformative research in the field of sustainability education; however, effect research was essentially missing in *JTEFS*. Here, one should recapture AERA’s recent calls for a positivist paradigm, and take a guess, either this lack of effect research is caused by the passionate echoing of the need for contextualised local research on sense-making in
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terms of sustainability by merely avoiding a research paradigm that asks for certain specific research skills, or due to a lack of resources for conducting rigorous quantitative research with random samples or comparative research involving several countries. The heterogeneity of the published studies in terms of the agentive perspective (Reunamo & Pipere, 2011) showed that research in TE for sustainability in general cannot be performed using a single approach or method. The participative orientation was found to be integrated both in qualitative and mixed method research; the only mode of research that did not involve the participative orientation was quantitative. However, the authors need to improve their skills in describing the methodological approach of their studies, especially in participative studies where the interest in practical activities and real-life engagement sometimes outshines the necessity to follow the requirements of a proper scientific report.

In general, the involvement of samples in the analysed papers was appropriate for the research problem and topic; the heterogeneity of the samples indicates the breadth of educational stakeholders involved in sustainable education, while use of mixed samples make the improvement of scientific rigour through data triangulation possible (Denzin, 1970). Again, the sampling approach and the samples involved should be depicted carefully and in detail. In addition, the researchers should not avoid probability sampling in quantitative studies that would enable the extrapolation of results from the studied population.

In connection with data collection methods, it was observed, especially for case studies, that the authors did not mention the research design or method. Compared with the findings in the study by Barth and Rieckmann (2013), a large share of the research also used case studies in JTEFS; however, considering data collection methods, the picture is somehow different. In their review of 110 journals on sustainability, the three most popular methods were surveys, document analysis and interviews; in JTEFS, the most frequent methods were surveys, interviews, tests/assignments and focus groups, which probably indicates the orientation of the research as focusing more on the practical elements of and “life-experience” within TE for sustainability. The detailed study of data analysis methods suggests a more nuanced diversification and the better scientific quality of both qualitative and quantitative data analysis methods in accordance with the research context and the refined description of these methods so as to allow peers to correctly repeat the study.

Along general lines, the articles published in JTEFS meet the demands of AERA in terms of multi-methodological approaches; however, as stated above, the description of the methods for data collection and analysis, the connection between TE and student learning as well as engagement with multi-institutional and multi-national studies need to be seriously improved. Nevertheless, the authors in JTEFS have rather successfully surmounted the dichotomies between researcher and practitioner and qualitative, quantitative and interpretative studies (Smeyers, 2008), which also indicates the holistic approach applied as the research methodology.

JTEFS 2005–2014: Surfing the Tide of Knowledge

The growth of JTEFS in terms of acceptance in databases was unexpectedly fast and successful; perhaps the change of the journal’s title, the selfless work of its editorial board, developments in the BBCC network and recognition from UNESCO have been the most significant inspirational factors in this process. The greater numbers of papers
authored by researchers from Daugavpils University (mostly ISE) at the beginning of the period analysed can be viewed not as a flaw in terms of authorship, but as start-up capital, since ISE was the place with innovative ideas for TE in sustainability education and globally recognized capacity for the further development of these creative ideas (UNESCO, 2009). The slight decrease in papers by doctoral students toward the end of the period can probably be explained by the growing interest in this journal from a more diverse population of researchers.

In order to portray the features of the cumulative knowledge building at JTEFS, we will attempt to use Legitimation Code Theory (Maton, 2014), which suggests that knowledge can be expressed in semantic waves – strengthening and weakening context-dependence and the concentration of meaning. It is recognized that semantic waves are a key characteristic of educational and intellectual practice and this seems to be the first attempt to use this theory to explain the development of a research paradigm in a single journal. Legitimation Code Theory uses codes of semantic gravity that refer to the degree of abstraction or degree to which meaning relates to context and semantic density that refers to the degree of the growth in complexity or of the concentration of meaning within practices.

As just stated, the beginning of the period analysed featured a large number of authors from ISE and their network partners that made the holistic approach popular among them, then the number of such publications decreased with the decline of holistic theory, although, researchers from other countries soon intercepted this and continued its development. At the end of the period, holistic theory had already developed into the more abstract and higher level complexity theory used mainly in theoretical papers. In terms of innovative theoretical development, it can certainly be traced more clearly in theoretical or interpretative research; however, some theoretical development would also be advisable in quantitative studies. The wavelike structure of the research focus is also depicted in the clusters of research topics discerned in the previous chapter with the ebb and flow of some topics in different intervals of period analysed.

Waves in the development of the research paradigm can also be traced in terms of theoretical and empirical papers: from abstract, generalized, complex meaning in theoretical papers with a holistic approach to more concrete and simpler meanings in specific examples of participative and interpretative research in the specific research area and back to a greater number of theoretical papers based on complexity theory toward the end of the period. The same wavelike pattern is noticed in terms of methodological approaches: if theoretical and quantitative research could be related to semantic gravity, but qualitative research to semantic density, then semantic density continuously alternated with semantic gravity prohibiting the extremes of these codes. Describing interpretative research as one with semantic gravity in opposition to participative research as more practical research featuring semantic density, we can again observe a wave of change from greater gravity to greater density and back, when in the middle of sample period, the participative genre displaces the interpretative genre of research for a limited time.

The development of the research paradigm in the journal shows a rising need for solutions to research problems, conceptual controversies, and so on towards the end of the period under observation. Again, an awareness of the need for multi-methodology gradually builds with the development of DESD, as is well illustrated by the features of the research paradigms in JTEFS (2005–2014).
According to Knutsson (2013), studies in ESD should not try to avoid discussions on important political and ideological contradictions, and on this score, it was observed that the amount of criticism of normative explanations and the practice of ESD/SD (definitions, guidelines, etc.) rises toward the end of period analysed, and thereby, also toward the end of DESD. Fortunately, ESD research is no longer looked upon as something immune to flaws, theoretical and methodological contradictions and other issues that certainly signify the healthy development of this field.

As the analysis shows, all six processes necessary for effective ESD (see Tilbury, 2011), namely, collaboration, dialogue, “whole system” engagement, curriculum innovation, teaching/learning and active/participatory learning were to some extent integrated either in the content or methodological approaches of JTEFS papers. The limits of space do not allow these processes to be analysed in detail, although, it is clear that greater emphasis in the analysed period was put on collaboration, dialogue, curriculum innovation and teaching/learning. Furthermore, the research in TE for sustainability published in JTEFS can be characterized as transformative research, where the researcher is a partner exploring the world with people (Tilbury, 2011). To achieve inter- and multidisciplinarity or conduct large-scale comparative studies providing system-wide evidence is still not likely. The lack of such studies hinders the development of the research field and the trust of educational policymakers in the power of this specific branch of sustainability research.

In regard to the rigorousness of the academic contributions to JTEFS, in general the quality of the theoretical and implicational aspects of papers currently surpass the quality of the methodological descriptions; however, the study indicated the serious improvement of the quality of the papers toward the end of the sample period.

Limitations, Implications and Suggestions for Further Development

One of the limitations of this contribution is concealed in the topic, since a single paper does not have sufficient room to perform a full quantitative and qualitative analysis of the research paradigm in any journal – the number of possible approaches and tools for the analysis are huge. Initial plans for a deeper and more critical insight into the content of articles from the position of critical discourse analysis have to be postponed for later studies, although such a study would benefit from the joint interpretation grounded on bibliometric indicators and features of research paradigms provided in the present paper. Furthermore, one of the faults of this paper is the small number of cross-comparisons between the indicators used in the bibliometric analysis and the description of the research paradigms. In addition, deeper explorations of sample articles from JTEFS may provide suggestions in regard to high quality academic writing or a full example of some research theme. Besides, the subjective bias of authors in performing the coding of the content categories in the bibliometric analysis, as well as the interpretation of the findings should be acknowledged; the authors are closely connected with JTEFS as editors, reviewers and authors, and as members and founders of BBCC.

The exploration of JTEFS articles triggered a large number of ideas for further research; for example, to analyse the research paradigm of TE for sustainability, collecting articles from all journals publishing papers in this area and comparing the research paradigm used in JTEFS with that from other journals oriented toward sustainability education. The authors also saw the value in conducting critical discourse analysis on
the papers of JTEFS searching for discourses illustrating the dominance of any research paradigm and institutionalization, discrimination of indigenous/alternative approaches to education, culture and research, power of political indoctrination, ideology, normative definitions or the social power of global institutions and funding agencies, the control of topics and topic change and interests of institutions vs. interests of individuals. Another avenue for future research would be cross-comparisons between the indicators used in the bibliometric analysis and the description of research paradigms in JTEFS, making it possible to reveal some important relationships and regularities. A more detailed analysis of sample articles from JTEFS to provide suggestions for high quality academic writing and elaborated examples for some research themes could also be of interest for potential authors of the journal.

At the end of this extensive paper we would like to offer just a few important implications and suggestions for the further development of JTEFS and the field of research in TE for sustainability as such. What is important about disciplined inquiry is that its data, arguments and reasoning should be capable of withstanding careful scrutiny by another member of the scientific community (Shulman, 1997). Hence, the spread of research outcomes through peer-reviewed journal articles can be used as a way to facilitate disciplined inquiry in any scientific discipline. Throughout this paper we tried to provide not only the quantitative and qualitative outcomes of our analysis, but also some critical point of view toward our findings to enable the careful reader to make some inferences from this paper. However, so as to ensure stronger emphasis on several facets, the following are some implications and recommendations for the further development of JTEFS:

1) Deal with the diversity of research coming from different parts of the world and preserve its specific individuality while maintaining the high standards of academic writing;
2) Increase the amount of large-scale multi-national, multi-institutional and multi-disciplinary research;
3) Improve the overall quality of publications paying particular attention to the methodological dimensions of contributions;
4) Strengthen the Editorial Board of JTEFS by inviting several experts in the research methodology of educational research and teacher education;
5) Respond to the call from the UNESCO GAP (UNESCO, 2014) to focus research on issues not fully resolved or even increasing during DESD;
6) Decrease the number of papers only marginally connected with TE for sustainability.

In order to imagine the future of research into TE for sustainability as a field, we will refer to the Roadmap for Implementing the GAP on ESD (UNESCO, 2014). Although the research as such is not yet explicitly designated among the five priority areas of the Global Action Programme (GAP) in ESD (UNESCO, 2014), it can easily be used to benefit each of them: evidence-based research can help in decision-making and advancing policy at local and global levels, the transformation of learning and training environments is hardly possible without transformative research, and the integration of ESD into pre-service and in-service TE programmes can be evaluated both at the level of local action research and cross-comparative global research. More research is necessary on youth involvement in ESD activities and the integration of ESD programmes and perspectives
in the planning, and the decision-making processes of the community can be enabled through cooperation with university-based researchers while engaging in participative community research. Although, the normative UNESCO documents can serve as a valuable framework for research development, we should be aware that researchers need to preserve their academic autonomy to choose their research topics outside of normative prescriptions and to feel entitled to make a thorough analysis and engage in the constructive criticism of normative concepts, approaches and documents.

To Conclude

For such a small country as Latvia, which only recently began to install the traditions of peer-reviewed journals in the social sciences and educational research, it takes considerable effort to establish and financially support a journal like JTEFS that has become recognized as a fairly large international success.

The majority of the aims set for the development of JTEFS by its founders almost 10 years ago (Salite & Pipere, 2007) have been successfully attained and even exceeded despite an economic crisis on a local and global scale, recent trends in the development of scientific research in terms of the denigration of the social sciences, education and the humanities, developmental trends and features of the social sciences and education. JTEFS is indexed in several publication databases, its content clearly focuses on different aspects of TE for sustainability, it has made some methodological advances and established thematic priorities, the scope of authors has evolved including representatives from different continents, countries, types of institutions and research backgrounds. As in good practice one should admit the successful instigation and development of the journal using networking and collaboration with BBCC affiliates, and the organisation of international conferences that determined the content and methodological focus of JTEFS. In particular, at the beginning of period under observation, the political, organisational and thematic orientation of the journal was inspired by ISE, whose members selflessly and passionately engaged in the establishment and further development of this research field notwithstanding different international and local challenges, unsustainable political and administrative changes characteristic of anthropocentrism (Steffen, Crutzen, & McNeill, 2007).

Much consideration, ideas and hard work were invested in JTEFS to build it to the level it is now. Its establishment is in some way a marvel; its growth cannot be denied. Although this study identifies some problems and controversies, we dare to admit that JTEFS has been a serious stakeholder for the development of research in TE for sustainability. This research area, albeit young, already demonstrates positive developmental trends and continues to evolve in harmony and interaction with other related fields of research. We hope that for the coming decade JTEFS will continue to be able to play its role as one of the most important driving forces in this research area on a global scale.
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The Challenges of Global Citizenship for Worldview Education. The Perspective of Social Sustainability

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Abstract

In this paper the authors briefly present what their theoretical reflections and empirical research has yielded in respect to citizenship education and religious education. The theoretical as well as political and practical questions of the relationship of global citizenship and worldview education are scrutinized. The main focus is on the issue whether there is or could be a connection between the concepts of ‘worldview education’ and ‘global citizenship education’ from the point of view of inclusivity in respect to both concepts. Habermas’s distinction between the concepts of democratic state citizenship and global or cosmopolitan citizenship is conceptually helpful. The authors also take into account the question of whether there is a certain educational, political or religious necessity on a national as well as global level to deal with this possible relationship as viewed through the lens of social sustainability.

Keywords: global citizenship education, democratic state citizenship, worldview education, inclusivity, social sustainability

In several publications the authors have paid attention to the relationship that exists between citizenship education and religious or worldview education in schools (Miedema, 2012; Miedema & Bertram-Troost, 2008), and quite recently the authors have also related it to human rights education (Miedema & Bertram-Troost, 2014). Reflecting further upon the notion of citizenship that the authors have used in their work, they realize that they have conceptualized that notion mostly in terms of their own country, the Netherlands, or in the context of the EC-funded empirical REDCo research project “Religion in Education: A Contribution to Dialogue or a Factor of Conflict in Transforming Societies of European Countries” within the framework of the eight particular countries that participated in that research being done in Estonia, Germany, Russia, Norway, the United Kingdom, the Netherlands, France and Spain (for an overview of this project see Jackson, Miedema, Weisse, & Williame, 2007). So, a kind of particularistic conception of the concept of ‘citizenship’ strongly related to the nation state or to West-Europe – even in a more or less sophisticated form – was presupposed in the present authors’ analysis combined with a plea for and reference to
contextuality. Taking into account several developments on a global scale the authors think that it is necessary to broaden the scope now to make it more inclusive and try to imagine what a notion like ‘global citizenship’ might mean if related to the inclusive concept of worldview education.

In this paper the authors will first briefly present what their theoretical reflections and empirical research has yielded in respect to citizenship education and religious education. Then they will scrutinize the theoretical as well as political and practical question of the relationship between the global citizenship and worldview education. Thus, the main focus is on the issue of whether there is or could be a connection between the concepts of ‘worldview education’ and the very notion of ‘global citizenship education’, and to scrutinize the question whether there is a certain educational, political or religious necessity to imagine this possible relationship with an eye on the perspective of social sustainability.

The next section will commence with the relationships between the citizenship education and religious education or, using the term the authors prefer – ‘worldview education’.

Citizenship Education and Worldview Education

The authors are strongly in favor of the concept of ‘maximal citizenship education’ as outlined by the late Terrence McLaughlin (see Miedema, 2014a; Miedema & Bertram-Troost, 2014), because it offers

a substantial notion of ‘education for citizenship’ in the context of the diversity of a pluralistic democratic society, a notion ... ‘thick’ or substantial enough to satisfy the communal demands of citizenship, yet compatible with liberal demands concerning the development of critical rationality by citizens and satisfaction of the demands of justice relating to diversity. (1992, p. 235, authors’ italics)

Such a society, according to McLaughlin, should seek to find a balance between social and cultural diversity with cohesion. A maximal approach to citizenship education is characterized by an emphasis on active learning and inclusion, is interactive, values-based and process led, allowing students to develop and articulate their own opinions and to engage in debate, dialogue and encounter. It presupposes not only teaching and learning about civic subject matter as in the minimal conception of citizenship, but also teaching and learning from subject matter, practices and experiences in respect to the pupils’ civic formation. In this constructivist conception the individual’s identity, individuation or subjectification is highly important and interpreted as dynamic instead of static, and it is a matter for incessant development, debate and redefinition. Maximal citizenship education “requires a considerable degree of explicit understanding of democratic principles, values and procedures on the part of the citizen, together with the dispositions and capacities required for participation in democratic citizenship generously conceived” (McLaughlin, 1992, p. 237), both in the school and society at large. Besides, the concept of maximal citizenship education offers the possibility to include religious content or aspects of worldviews that are of value in the different curriculum components of the educational program. This is fully compatible with what has been claimed elsewhere to be the aim of education in schools for a transformative
pedagogy, meaning that every child and youngster in every school should be able to
develop her or his personal identity or personhood (Biesta & Miedema, 2002; Miedema,
2014b). Thus, maximal citizenship education can include and also should imply the
fostering of the religious and/or worldview component of the child’s personhood for-
mation.

In the title of this section we already used the term ‘worldview’ instead of the
case of ‘religion’. The reason for this preference is that not everyone is an adherent
of a religious view on life, the world and humanity, thus acknowledging the presence of
a transcendental entity. Notice, for example, that humanism and atheism are worldviews
but that they are not religions. We use the concept ‘worldview’ with ‘religion’ as a sub-
concept of it, and define it as the system, which is always subjected to changes, of
implicit and explicit views and feelings of an individual in relation to human life. ‘Views
and feelings in relation to human life’ can refer to everything with which people can be
occupied with and what can be important to them. In empirical research with students
we use a short ‘stipulative definition’ namely: “A worldview is the way one looks at
life” (Bertram-Troost, de Roos, & Miedema, 2006, p. 311). The use of the concept of
‘worldview’ may help to avoid strong secularist approaches that direct themselves against
religion. In these views religions and worldviews are strictly separated from the public
and the social domain and positioned in the private realm of the family and/or religious
communities, and should be completely left out of the curriculum of the school. However,
everyone has at least a personal worldview that is a view on life, the world and humanity
providing answers to existential questions. Such personal worldviews are sometimes
but not always directly influenced by an organized worldview, and this should be pedago-
gically taken into account as we have claimed elsewhere (see Van der Kooij, de Ruyter,
& Miedema, 2013). The inclusive concept of ‘worldview’ can also prevent exclusivist claims
leading, for example, to preferential argumentation in paying attention to one religion
only, for instance the Christian one, or to one worldview – the liberal-democrat one.
Both cases can be interpreted as the worldview or religious claims against, for instance,
the universal claim in human rights of children that they have the right of self-development
and self-appropriation. A thick conception of worldview education includes teaching
and learning about and from worldviews and/or religions, and this is in contrast to a
thin conception that is just teaching and learning about worldviews and/or religions.
Worldviews and religions may manifest themselves in organized as well as personal
forms, and with or without a relationship between the personal and one particular
organized form. Increasing individualism and awareness of the diversity of organized
worldviews due to globalization have stimulated the construction of people’s own indivi-
dualized personal worldview. This construction process is characterized as the ‘bricolage’
(Hervieu-Léger, 2006).

During the first decade of the 21st century the Council of Europe has given a strong
impetus to the democratic citizenship education in the member states, for example, in the
Charter on Education for Democratic Citizenship and Human Rights Education
(Council of Europe, 2010). This momentum has been steadily acknowledged in relation-
ship to the (inter)religious education combined with intercultural education. The aim
for this pedagogical, educational, as well political program was to strengthen the poten-
tialities of strong, open and inclusive thinking of children and youngsters regarding
religion and worldview, and to tackle the dangers of religions and worldviews within
the setting of the schools (see Jackson, Miedema, Weisse, & Willaime, 2007). Schools,
being embryonic societies as John Dewey has characterized them (Dewey, 1897/1972; 1916; 1927), should embody and practice the constituent elements of real participative and deliberative democracies. Following and further elaborating on Dewey’s pragmatist view, pedagogically speaking and from a societal as well as political perspective it is desirable that children already in the embryonic society of the school, experience, are confronted by and become acquainted with the other children’s religious or worldview, cultural, ethnic, economical backgrounds, ideas, experiences, practices, situations, and contexts. Seeing the impact of religious/worldview and the influence of the political, cultural and economic domains both locally and globally, children can also benefit from such experiences and insights when they encounter religious/worldview, cultural, ethnic and political ‘others’ in society at large, and around the globe. However, the school has its own place here sui generis. So, from a societal as well as pedagogical point of view, all schools should be willing – and in our opinion should be obliged – to aim for fostering democratic citizenship education, interreligious or inter-worldview education, and human rights education. Thereby, bringing about mutual respect and understanding and stimulating the development of democratic citizenship formation, worldview citizenship formation, and human rights formation, schools can improve the global and sustainable dynamics.

On the basis of a special issue of the Dutch academic journal Pedagogiek, edited by the present authors together with Wiel Veugelers (see Miedema, Bertram-Troost, & Veugelers, 2013) we can make up the balance sheet of how worldview education is broadly favored and practiced nowadays in schools in France, England, the Netherlands, Belgium and in particular parts of Germany. Just to limit ourselves to the Netherlands here: all schools, that are denominational as well as public schools are invited by the government to relate citizenship education to worldview education. For the more orthodox Protestant and Roman-Catholic schools this creates the challenge to really deal with religious and worldview diversity instead of taking an exclusive mono-religious stance. It challenges public schools to deal with the diversity of worldviews and religions in an active pedagogical way. So, instead of acknowledging that there is worldview diversity in the school, the teachers should take this up in their pedagogical and didactical practices. The core issue is that in these schools the pupils’ self-responsible self-determination regarding worldview and religions (Miedema, 2014a, p. 371) should be seen as the main pedagogical aim of a values-based curriculum.

In the next section of this paper the authors will deal with the question of whether there is or could be a connection between the concepts of ‘worldview education’ and the very notion of ‘global citizenship education’, and will scrutinize the question whether there is the necessity and the possibility to relate this to social sustainability.

**Broadening the Scope with the Notions of Global Citizenship and Social Sustainability**

We notice that there are some worldwide problems related also but fortunately not exclusively to religions and worldviews that we have to face today. Just to mention couple of them here, one can recall the recent attacks in Paris on Charlie Hebdo, the travel of jihadists from the West to Syria and Iraq as well as the problems associated with returnees from these countries and jihadists that still stay in their own countries. These problems do not ask for exclusive particularistic approaches or for an exclusive
focus on national or even regional identities. On the contrary, these problems do concern every human being, humankind and humanity in its broadest global sense. The current global constellation is, in our view, triggered by the question of the necessity to think and act more globally in religious education and worldview education in order to prevent, for example, the development of narrow minded or radicalized children and young people. For that reason it is necessary to imagine how democratic state citizenship education and global citizenship education could form a continuum.

These issues also immediately relate to the very concept of social sustainability. They present some of the greatest challenges of our time, are part and parcel of every nation in the world, do concern every human being, humankind and humanity in general and on a global scale, they have to do with the human shaping of the world by means of globalisation, and connect at least to political and social learning processes due to their intercultural and transcultural nature (see Brunold, 2015).

It is our view that the role and function of human rights education might be of great help here to broaden the perspective on citizenship toward the global citizenship. If a government would take the responsibility for an inclusive concept of citizenship education seriously, it should mean that without any governmental preference for a particular worldview or religion, each government could assume what we characterize as the political-pedagogical responsibility to stimulate the policy of and practice in schools to foster religious or worldview education as a part of an integral citizenship education (see Miedema & Bertram-Troost, 2008). Adding to this political-pedagogical responsibility, the responsibility for human rights education as an integral part of this should imply that the state should feel obliged to stimulate in schools the building and defense of a universal culture of human rights in society and globally, with a view on the promotion and protection of human rights and fundamental freedoms in a societal and/or global way.

We will provide an example from our own country, the Netherlands, to show why stressing the universality of human rights and children’s rights is an ongoing need. Right wing parties but also liberal democrats and Christian democrats are now and then trying to particularize – or in our view even to provincialize or nationalize – the interpretation of human and children’s right in respect to strangers. Here we have the tension between the open universality on a national and local level versus segregated or closed particularity. Or to put it differently: the tension is between thick constitutionalism including transnational focus on human rights and especially the position of the individual versus thin constitutionalism with a national focus on the national context, particularly in terms of heritage and culture in a tense relationship with human rights (see Miedema & Bertram-Troost, 2014).

What might be very helpful here is the way Jürgen Habermas in 1992 has dealt with these tensions between particularistic and global notions of citizenship (see also Miedema & Bertram-Troost, 2008). He observed that in the 80s and early 90s of the 20th century most prosperous countries in West-Europe were confronted with a growing stream of immigrants and refugees from poor and/or turbulent areas of South and East Europe, the Middle East, and Africa. Talking about citizenship and national identity was primarily reinforced by the fear that the state of affluence or the welfare states of these prosperous countries were threatened by the incoming masses. Habermas has so adequately characterized this mechanism as the ‘chauvinism of affluence’ (Habermas, 1996, p. 507). He introduced a distinction between two conceptions of the concept of
‘citizenship’: a classical-liberal view stressing private citizenship and the sovereignty of the nation state, and a democratic-liberal view pointing to social citizenship in line with the welfare state interpretations at the level of the state. In respect with these two conceptions Habermas stated:

The identity of the political community, which also must not be violated by immigration, depends primarily on the legal principles anchored in the political culture and not on an ethnic-cultural form of life as a whole. It follows that one must expect only that immigrants willingly engage in the political culture of their new home, without necessarily abandoning the cultural life specific to their country of origin. The political acculturation demanded of them does not extend to the whole of their socialization. Rather, by importing new forms of life, immigrants can expand or multiply the perspectives from which the shared political constitution must be interpreted. (1996, pp. 513–514)

Habermas takes a stance against any exclusive particularistic interpretation of citizenship in terms of a specific ethnic-cultural identity, and is in favour of a political or inter-subjective meaning of citizenship. The argument for that option was and still is that the identity of a political community is primarily embedded in the principle of the political culture, and not in a specific ethnic-cultural way of life. Cultural and political claims are, however, not completely separable. They overlap each other and influence each other’s territory. Such a conception of democratic or social citizenship offers the possibility and can pave the way for a global citizenship. The worldwide nature of problems we have to face does not ask for an exclusive particularistic formulation of the problem, not even for an exclusive focus on national identity. Those problems do concern every human being. For that reason it is necessary that democratic state citizenship and global citizenship form a continuum (Miedema & Bertram-Troost, 2008).

From the perspective of the relationship between the democratic state citizenship and global citizenship it is useful to refer here to the highly insightful debate between Martha Nussbaum and Charles Taylor in the midst of the 90s in the last century, because that discussion makes clear that two notions of democratic state citizenship and global citizenship should not be separated (see in extenso Papastephanou, 2013 who pointed us to this debate).

In the article by Nussbaum (1994) patriotism and cosmopolitanism were conceptualized as mutually exclusive concepts, and it is clearly stated that she is in favour of the latter concept and this to the detriment of the first one is due to the risks of fanaticism that easily come with patriotism. In his reaction to this article Taylor (1996) criticizes this drastic choice for cosmopolitanism and states that we need both in the modern world, because “modern democratic states are extremely exigent common enterprises in self-rule. They require a great deal of their members, demanding much greater solidarity towards compatriots than towards humanity in general. We cannot make a success of these enterprises without strong common identification” (Taylor, 1996, p. 119). Taylor wants to fight for the kind of patriotism which is open to universal solidarities against other, more closed kinds (see Papastephanou, 2013, p. 176). In her later writings Nussbaum’s view converges, however, strongly with Taylor’s conviction when she, for instance, asserts that she envisages a complicated dialogue between local attachments and loyalty to humanity (Papastephanou, 2013, p. 167).
Using the concept of ‘worldview’ as an embracing concept in respect to ‘religion’ and making it all inclusive that way due to its broadened denotation, the same could analytically be said regarding democratic state citizenship and global citizenship. The latter one is the broadened, more embracing or inclusive one but always linked to the first form of citizenship.

Yet, we have also broadened our scope by intertwining a strong relationship of worldview education, citizenship education and human rights education with social sustainability positioned on a national as well as a global level. Along these lines elements of what might be coined as a pedagogy of social sustainability could strengthen our transformative pedagogical approach (Miedema, 2014b), thus helping pupils to see how the world could be shaped locally and globally with a strong concern for every human being, humankind and humanity in general and on a global scale and making them sensitive to the political and social, that is – intercultural, transcultural and inter-religious components of these processes and practises.

Conclusion

In sum, in this article we have articulated our preference for the notion ‘worldview’ due to the inclusivity of the denotation of this concept, and because, in pedagogical terms, it can stimulate dialogue, encounter and participation, leading to the participatory democracy in a Deweyan sense (Dewey, 1916, pp. 86–88). The contemporary global problems related also but not exclusively to religion and worldview, next to ecological issues, urges us, in our view, to broaden the range of citizenship and to make it a more inclusive concept by means of the concept of ‘global citizenship’, just like ‘worldview education’ is a broader term than ‘religious education’.

We have argued that human rights education can also foster a universal and global stance as an antidote against exclusive particularistic interpretations of citizenship and in favour of an inter-subjective interpretation of citizenship. Democratic state citizenship education combined with global citizenship education can strengthen such learning processes. This can be practiced in schools in combination with an inclusive stance to religions and worldviews. Combined with social sustainability this might help pupils to see how the world could be shaped locally and globally with a strong concern for every human being, humankind and humanity in general and on a global scale. These are the challenges of global citizenship for worldview education but also the challenges of worldview education for global citizenship from a social sustainable perspective.

Finally, there are some social sustainable institutional pre-conditions in demand that specify the embracing pedagogy implicated in our plea. First, all stakeholders (ministry of education, politicians, school leaders, teachers and parents) should be convinced that edification or Bildung is the main aim of what is going on in schools instead of only the so-called ‘core subjects’ such as reading, writing and mathematics or the preparation for the knowledge-based economy in terms of employability. It also presupposes school administrators with a pedagogical vision who are able to communicate and share it with their staff in order to build transformative practices. We also need teacher colleges where teachers in statu nascendi can develop their knowledge, skills and attitudes and who can become pedagogical professionals able to embrace transformative pedagogical situations and relations in their schools together with their colleagues.
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Using Analogies in Teaching Physics:
A Study on Latvian Teachers’ Views and Experience

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Abstract

The role of analogies as tools for teaching difficult science concepts has been widely discussed in science education. The application of analogies in the context of sustainable education involves richer potential. The purposeful use of appropriate analogies can facilitate analogical thinking and transfer skills, as well as develop abilities which are required for life and lifelong learning, including successful integration into modern society and facility within our technology saturated world. Analogical thinking supports development of students’ higher order thinking skills. The aim of this study was to identify Latvian physics teachers’ views on the importance of analogies and the methodology of their usage in physics education, as well as to discover innovative examples of analogies. The study involves both quantitative and qualitative methodology: survey of 35 secondary school physics teachers and group interviews with 18 experienced physics teachers. The findings reveal that, in general, now and then Latvian physics teachers use analogies in their pedagogical practice, although they are mostly simplistic and with illustrative character. Some teachers use analogies in order to help students build new knowledge through activating, transferring, and applying existing knowledge and skills in unfamiliar situations.

Keywords: analogy, analogical thinking, transfer skills, teaching physics, teachers’ views

Context of the Study

Education is a key agent for change towards sustainable development (UNECE, 2011). The relationship between education in general, science education and sustainable development is complex. Education for sustainable development (ESD) requires new ways of conceiving goals, tasks, organization of learning processes, and teacher training. Although the specifics of curriculum and didactics, or the specifics of any subject and its associated teaching methods, have been empirically studied in relation to different aspects of ESD (e.g., Gerretson, Howes, Campbell, & Thompson, 2008; Jonāne, 2008; Soobik, 2014), there are still many opportunities both for general education and teacher education to discover innovative approaches based on the principles of sustainability.

According to research carried out by a group of experts from the European Commission (2007), the interest of youth in science subjects, including physics, has decreased.
The European Commission points to the complex reasons for this decline, further stating that “there is firm evidence that indicates a connection between attitudes towards science and the way science is taught” (p. 8). Experts stress the idea that teachers are the key players in the revitalization of science education. Specialists of the Community Research and Development Information Service (CORDIS) (EC, 2013) project emphasize that “conceptual change is a core feature of learning science. It reflects the knowledge transformation and development that occurs during the learning process... Analogical reasoning plays a central role in the process of conceptual change” (p. 1).

The interest in physics among Latvian school-aged youth is low, notwithstanding diverse activities in the field of science education. Starting in 2005, new curricula content were designed by the EU/ESF project Production of Educational Content and Promotion of Teacher’s Qualification in Science, Mathematics and Technology and has been introduced into Latvia’s schools since 2008. This new physics curriculum and support materials for teachers were designed by drawing on the basic principles of contemporary science education. They envisaged (1) the understanding of processes, regularities in nature, and use of mathematical models; (2) acquiring research and information processing skills including the use of information technologies; (3) learning physics with a connection to real life by learning the interconnections between science, technologies, society, and environment in the context of individual needs.

This article focuses on aspects of physics teacher education in promoting students’ deeper learning and transfer dexterity through use of analogies. These are aspects of physics education that have not received sufficient attention from either university teachers or researchers. Because of the range and interconnectedness of physics knowledge, deeper learning is particularly relevant in the context of education for sustainability (Warburton, 2003). Students acquire such knowledge during their secondary education, including exposure to social, environmental, and economic issues, as well as the importance of interdisciplinary thinking and holistic insight. Therefore, during pre-service and in-service teacher education, physics teachers should comprehend strategies and develop professional competences to help support their students’ deeper learning approaches and transfer skills, as well as cognitive and meta-cognitive strategies that can be applied to solve students’ personally important problems.

Deeper learning is a key strategy by which students extract meaning and understanding from course materials and experiences (Warburton, 2003). According to Pellegrino and Hilton (2012), deeper learning is the process through which an individual becomes capable of taking what was learnt in one situation and applying it to a novel situation. The product of deeper learning is transferable knowledge, including content literacy in a domain, as well as understanding how, why and when to apply this knowledge in real-life situations.

As defined by the Hewlett Foundation (Huberman, Bitter, Anthony, & O’Day, 2014), deeper learning competencies focus on the development of knowledge and cognitive skills, particularly mastering core academic content knowledge and developing critical thinking skills. This definition characterizes students’ mastery of core academic content as the ability to “develop and draw from a baseline understanding of knowledge in an academic discipline and ... to transfer knowledge to other situations” (p. 9). In other words, students are able to process and transfer information in meaningful ways within new contexts to address new problems; furthermore, they are able to apply and transfer
core knowledge to tasks in other subjects and in real-world situations, as well as in non-routine ways.

The identification, analysis and adjustment of global experience delineate important steps in the improvement of teacher education for the implementation of contemporary educational goals in each and every country. Although deeper learning is not directly emphasised in the Sustainable Development Strategy of Latvia until 2030 (Saeima of the Republic of Latvia, 2010), it appeals to the features of deeper learning focusing on the development of creative thinking: “[The] general education system should develop a creative personality in each learner. By including problem-solving in the study process, independence and transition from practical skills to conceptual knowledge would be promoted” (p. 38). These suggestions are in strong conformity with deeper learning competencies. Ability of creative thinking has a powerful connection to the development of meaningful learning and transfer skills.

Teachers’ understanding of strategies to promote deeper learning affects the quality of education. One of the strategies that contributes to deeper learning and development of transfer skills is a purposeful use of analogies in teaching science, including physics. It is, therefore, essential to identify the usage of analogies in teaching science as well as articulate the opinions and experience of teachers regarding this issue.

**Analogies and Analogical Reasoning from a Constructivist Perspective**

Analogies and analogical models have always been a key part of scientific reasoning from the eighteenth century onwards and have helped scientists understand, present and communicate about the phenomena and structure of the natural world (Glynn, 2008; Harrison & Treagust, 2006). Yet, learning by analogies occurs not only in scientific contexts. For instance, transformation of economic development towards sustainable development is accomplished through analogical reasoning from the source context of ecological systems to the target contexts of economic outcomes (Sriram, Ganesh, & Mathumathi, 2013).

Analogical reasoning is a cognitive skill that underpins many 21st century competencies (Richland & Simms, 2015). It is the process of representing information and objects in our world as systems of relationships, such that these systems of relationships can be compared, contrasted, and combined in novel ways depending on contextual goals. Analogical reasoning requires a type of scrutiny involving memories and prior experiences in an effort to solve problems or critique solutions, and to explain or interpret situations (Gentner, 1983; Richland & Simms, 2015). It is a key feature of the learning process as framed within a constructivist perspective: every learning process includes a search for similarities between what is already known and the new, as well as the familiar and the unfamiliar (Wittrock & Alesandrini, 1990). Analogy pervades our thinking, from our everyday speech and our trivial conclusions to artistic ways of expression and formulating our highest scientific achievements (Polya, 1954). Analogy is a mechanism which has been recognised by scientists, philosophers and psychologists alike as having the potential of bringing prior knowledge to bear on the acquisition of, sometimes, radically new information (Vosniadou, 1988). It can play a central role in the restructuring of students’ conceptual frameworks (Duit, Roth, Komorek, & Wilbers, 2001). Politicians and other public figures often use analogies in their public performances and discussions.
The term ‘analogy’ refers to a cognitive process of transferring information or meaning from a particular object (the analogue or source) to another particular object (the target). Analogy is an inductive mechanism based on structured comparisons of mental representations (Holyoak, 2012). An analogy is a comparison through which an idea, a thing or a process is contrasted to another that is quite different from its counterpart. The aim is explaining that idea, thing or process by comparing it to something that is familiar. The use of analogy is often viewed as one of the primary means of drawing on students’ prior knowledge. By activating relevant prior knowledge which is already understood by the learners, the analogy serves as a vehicle to bring meaning to incoming information (Brown & Clement, 1989).

In many analogies, the similarity of the objects is at a purely relational level. An example is the analogy that led to Kekule’s theory about the molecular structure of benzene (see Holyoak & Thagard, 1995). In a dream, Kekule had a visual image of a snake biting its own tail which gave him the idea that the carbon atoms in benzene could be arranged in a ring. The similarity between the snake and the carbon atoms was at the purely relational level of a circular arrangement. The fact that the objects being compared in an analogy should be linked by the same relationships is widely accepted to be the hallmark of analogical reasoning. On the basis of certain similarities, a principle or characteristic of one term is applied to another term and asserted as true in that case as well.

According to Holyoak (2012), analogical reasoning is a complex process involving retrieval of structured knowledge from long-term memory, representing and manipulating role-filler bindings in working memory, identifying elements that play corresponding roles, and generating new inferences and learning abstract schemas. Human analogical reasoning is heavily dependent on working memory and other executive functions supported by the prefrontal cortex, being selectively activated when multiple relations must be integrated to solve a problem.

Analogical reasoning is a key feature of the learning processes within a constructivist perspective; every learning process includes a search for similarities between what is already known and the new, as well as the familiar and the unfamiliar, to actively apply prior knowledge in a new situation (Wittrock & Alesandrini, 1990). Constructivist models of learning emphasise that connecting the new knowledge to be acquired with the existing knowledge is essential in order to promote meaningful learning (Limon, 2001). Meaningful learning occurs when students are not only able to remember knowledge, but also to transfer it to new situations. According to Duit and his colleagues (2001), new conceptual frames are developed when transferring structures from familiar to new domains by establishing an analogy between the familiar and the unfamiliar.

**Analogy in Physics Teaching and Learning: Some Didactic Explanations**

Physics has played a crucial role in understanding the fundamental laws of nature; its concepts and techniques underpin the progress of all other branches of science and technology, as well as in transforming humanity to the present-day. Physics is essentially a science of abstractions that are not easy to understand unless related to everyday experiences. Reasoning by similarities is one of the greatest sources for the development of physical theories; moreover, it is an important tool in physics education both at
school and higher-level education. Science teachers, in a same way as scientists, frequently use analogies to explain concepts to students (James & Scharmann, 2007). These concepts often represent complex, hard-to-visualize systems with interacting parts: including atoms, electric current, voltage, and electromagnetic waves. Much of the research (Aubusson, Treagust, & Harrison, 2009; Duit, 1991; Gentner, 1983; Gentner, 1989; Glynn, 2008; Treagust, Harrison, & Venville, 1998, etc.) has focused on how teachers understand and use analogies in science education. These theoretical findings apply to physics teaching as a school science subject. Therefore, it is important both to aggregate the theoretical insights from pertinent studies and to recognize physics teachers’ experiences related to the use of analogies.

Scientists conceptualize analogy differently. According to Poincaré, analogies can be classified by level: from “primitive analogies”, about immediate sense impressions, to “mathematical analogies” which maintain a structure’s relations beyond the simplistic relation dependent on appearance. For Poincaré, primitive analogies are usually just a brief comparison, which utilizes the imagination but lacks critical thought (Cruz-Hastenreiter, 2015). Besides, analogies can be represented in different formats: verbal, pictorial (Thiele & Treagust, 1994), real-object modelling and animation (Kim & Ryu, 2001).

An analogy in physics is not just a comparison between different domains: it is a special type of comparison that is defined by its purpose and by the information it elicits. Nevertheless, analogies in a more elaborate sense, particularly mathematical analogies, are a form of reasoning that involves representative thinking (Cruz-Hastenreiter, 2015). Analogies can boost student learning by providing visualization of abstract concepts, by helping to find similarities of the students’ real world with the new concepts, and by increasing students’ motivation (Aubusson et al., 2009; Duit, 1991; Harrison & Coll, 2008; Treagust, Harrison, Venville, & Dagher, 1996). Analogy draws a bridge from the concrete material world to the abstract physics domain (Dilber & Duzgun, 2008; Duit, 1991). Analogies allow new material, especially abstract concepts, to be more easily assimilated with students’ prior knowledge, enabling them to develop a more scientific understanding of the concept. When students explore new concepts, meaningful learning proceeds when they find and visualize connections between a newly taught construct and what they already know.

Familiar analogies, such as mechanical fluctuations or mechanical waves, often serve as initial mental models that students can use to form limited, yet meaningful, understanding of complex target concepts such as electromagnetic fluctuations or electromagnetic waves. As Duit and his colleagues (2001) explain:

A growing body of research shows that analogies may be powerful tools for guiding students from their pre-instructional conceptions towards science concepts. But it has also become apparent that analogies may deeply mislead students’ learning processes. Conceptual change, to put it into other words, may be both supported and hampered by the same analogy. (p. 283)

If the analogies are appropriate, they promote concept learning that can encourage students to build links between past familiar knowledge or prior experiences and new contexts or novel problems (Harrison & Treagust, 2006). According to Vosniadou (1988), productive use of an analogy involves analogical reasoning to produce a new understanding of the explanatory structure of a target system. Gentner (2002) notes
that the “basic intuition behind analogical reasoning is that when there are substantial parallels across different situations, there are likely to be further parallels” (p. 106). In this sense, analogical arguments can be used to generalize concepts, theories and methods. Furthermore, analogies can be motivational in that, as the teacher uses ideas from the students’ real world experiences, a sense of intrinsic interest can potentially be generated (Aubusson et al., 2009; Venville & Treagust, 1996).

Educational researchers argue that analogies can guide students towards conceptual change (Brown & Clement, 1989; Duit et al., 2001). Podolefsky and Finkelstein (2007) conclude that analogies lead to conceptual change more readily than the abstraction and students may develop the skill of abstraction by building upon lower-level analogical thinking skills. Holyoak and Thagard (1995) posit that the very act of forming an analogy requires a kind of mental leap: it necessitates visualizing one thing as if it were another, such as the flow of automobiles in roadways gives possibility to imagine an electric current in circuitry.

Famous analogies in science frequently reveal an ability to make mental leaps. For example, the idea of envisaging heat as a fluid that can be contained in warm objects with the ability to flow from one object to another has been a powerful image throughout history and is still used today. James Clerk Maxwell developed the theory of electromagnetism by drawing physical analogies between fluid dynamics and electromagnetic phenomena. Albert Einstein, possibly the greatest metaphorical thinker ever, conducted thought experiments that helped to lead him towards his rebel view of light as particles rather than waves (Hofstadter & Sander, 2013). As well as being an important cognitive mechanism in creative thinking, an analogical approach is a basis for problem solving and forms a core component of everyday mental processing.

Despite their advantages and usefulness, analogies can also cause incorrect or impaired learning depending on the analogue/target relationship. If the teacher uses an analogy that is unfamiliar to the learner, development of understanding through use of that particular analogy is constrained. Although analogies may be more useful to students who primarily function at the concrete operational level, analogical reasoning may be limited if the students struggle to compare the similarities between the ideas. In contrast, students already functioning at a formal operational level may have an adequate understanding of the target and the inclusion of an analogy adds unnecessary information (Treagust et al., 1998). Some authors (Aubusson et al., 2009; Dilber & Duzgun, 2008) warn that the use of analogies in science, including physics teaching, does not always produce the intended effects; this is especially true when students take an analogy too far and are unable to distinguish it from the content being learned. Duit and his colleges (2001) stress that the analogical relations have a clear and fixed meaning from the perspective of the analogy provider. These meanings are often not shared with the students. Students are in a different position than teachers and textbook authors. [The] analogy may be viewed differently by learners and teachers, that is, bring about different observations. Students, therefore, may not see the analogy at all. (p. 286)

An essential aspect of the physics teaching methodology is an effective use of analogies. The purpose of analogy is the transfer of a relational structure from a known
or familiar domain to a less known domain. Richland and Simms (2015) claim that analogy can be understood as a powerful learning tool; analogy and analogical reasoning can produce learning in a variety of instructional contexts; teaching should lead students to view knowledge as something to be refined, manipulated, connected to other information, and otherwise used across contexts to serve one’s goals.

Analogical reasoning has been defined as a goal-oriented process of representing information and objects in the world as systems of relationships and drawing connections across these systems of relationships (Gentner, 1983). According to Gentner’s (1983) structure mapping theory, “an analogy is a mapping of knowledge from one domain (the base) into another (the target) which conveys that a system of relations that holds among the base objects also holds among the target objects” (p. 201). Both the analogue and the target have features. Thus, the strength of an analogy lies less in the number of features of the analogue and target domains than in the system of connected information that it conveys (Gentner, 1983; Orgill, 2013). A systematic comparison, verbally or visually, between the features of the analogue and target is called a mapping. To use the analogy is to complete a mapping from one structure to another.

Gentner (1983) calls this theoretical framework structure mapping: fit to the target domain from the analogue domain; for example, electric current is analogous to water flow. Aubusson and his colleagues (2009) agree that the mapping of like and unlike attributes is essential to any effective pedagogy that uses analogy for science learning. According to Richland and Simms (2015), understanding the key steps of structure mapping is important in order to develop cognitively grounded insights for supporting higher order thinking:

It is the process of representing information as systems of relationships, aligning and comparing/contrasting these systems to develop higher order relationships (such as same, different, or causal), and then drawing inferences, problem solving, and reasoning on the basis of those higher order relationships. (p. 180)

Based on an extensive body of research with many schools, teachers and lessons, Treagust and his colleagues (1998) proposed the Focus—Action—Reflection (FAR) guide. The FAR guide has three stages for the systematic presentation of analogies and resembles the planning phases of expert teaching and the action research model. At first, teachers recognise what difficult or abstract concept they want to teach and what analogy could be appropriate. Focus refers to the decision about using the analogy when teachers initially consider the different aspects of the concept to be taught, whether or not the students already know something about the target concept: Is it difficult, unfamiliar or abstract? What ideas or prior knowledge do the students already have about the concept? Is it difficult, unfamiliar or abstract?

Action refers to the class presentation when the teacher pays careful attention to the students’ familiarity with the analogue and identifies the common and uncommon features of the analogue and target science concept or process. To achieve this, the features of the analogue and target are negotiated with students. Similarities and differences are drawn between them and ways that the analogue and the target are not alike are explicitly identified. Is the analogy clear and effective rather than confusing? The action phase usually involves at least three cognitive steps: familiarity with the analogue, mapping of the shared attributes and, then, negotiating with the students where the
analogy breaks down. For example, knowledge about Newton’s law of gravitation helps to understand and remember Coulomb’s law of electrical interaction force. Both are inverse-square laws and both have constants. However, although the laws are similar, it is important to emphasize differences between them. In Newton’s law, gravitational interaction force depends on the mass of an object; in comparison, the electrical interaction force in Coulomb’s law depends on the electrical charge of a particle or an object. Furthermore, although both laws have constants, in Newton’s law it is a very small number whereas in Coulomb’s law it is a very large number. Yet another distinction is that gravitational force only attracts, while electrical force attracts when charges are different but repels when they are similar.

Reflection takes place after the analogy has been used in class when the teacher discusses the clarity and usefulness of the analogy and draws conclusions. Reflection is characteristic of all good teaching and competent teachers implement this step in their pedagogical work. In summary, the FAR guide supports teachers to maximise the benefits and minimise the constraints of analogies when they arise in classroom discourse or in textbooks.

Accordingly, it can be assumed that the teacher’s ability to implement the FAR guide when teaching physics promotes deeper learning. In particular, this pedagogy supports development of awareness toward an appreciation of environmental, social and economic issues, which are essential for ESD. The teacher’s ability to include a wide range of problems within the context of sustainable development promotes students’ comprehension and mindfulness of the consequences of human activities such as climate change, resource depletion, and adverse environmental factors on human health. As well, use of analogy during the learning process develops students’ higher order thinking skills, which are essential for the development of responsible citizenship. This idea is highlighted in the book Analogy is as the Fuel and Fire of Thinking (Hofstadter & Sander, 2013) which describes analogies as a main process of thinking. Therefore, it is of great interest whether physics teachers use analogies, and the FAR model in particular, in their teaching.

Purpose of the Study and Research Questions

The purpose of this study was twofold: 1) to identify Latvian physics teachers’ views on the use of analogies in teaching physics, including the context and main aspects of their usage, and 2) to evaluate teachers’ comprehension and beliefs about the role of analogies in the promotion of transfer skills and deeper learning. The present study is linked with teachers’ reflection-during-action, as well as after the event where teachers consciously review, describe, analyse and evaluate their past practice with a view toward gaining insight to improve their future practice (Finlay, 2008).

This study focuses on four main research questions: 1) What are the views of physics teachers on the use of analogies? 2) What types of analogies do they use? 3) How do physics teachers evaluate their students’ achievement in relation to analogical problem solving? and 4) What are the main aspects of the usage of analogies during physics instruction?
Method

Research Tools and Data Analysis

In this research, both qualitative and quantitative methods were combined (Creswell, 2003); that is, a questionnaire was administered and group interviews were applied. To gather useful and relevant information about the teachers’ views, the questionnaire was prepared and piloted with Master programme students enrolled as emerging physics teachers. After the piloting process, some items in Part 2 of the questionnaire were clarified and Part 4 was added to the questionnaire to ask about the personal views or experiences regarding the usage of analogies during the physics teaching/learning process. The revised questionnaire was distributed to physics teachers via e-mail.

The questionnaire consists of four parts. The Part 1 collects the information on the respondents’ demographic data such as gender, age, qualification, teaching experience, and school type. Part 2, titled “Views on using analogies in teaching physics”, contains 12 items to be assessed by a five-point Likert scale that ranges from agree to disagree (see Table 1). The first three items inquire whether the teachers use analogies in general and whether they use them consciously. Other items were formulated according to the findings of Aubusson et al. (2009), Podolefsky and Finkelstein (2007), Holyoak and Thagard (1995), Duit (1991), and Vosniadou (1988) regarding the different aspects of usage of analogies in science and particularly during the physics teaching/learning process described above. This section of the questionnaire presents an opportunity to detect the teachers’ views related to analogical reasoning and transfer skills development. Part 3 of the questionnaire relates to the teachers’ experience in regard to a specific example of analogy usage. The prompt was taken from Latvian National Sample of the Physics Programme (Izglītības satura un eksaminācijas centrs [Curriculum Development and Examination Center], 2008) concerning a visual aid comparing the gravitational and electric fields. Teachers are asked to comment and describe their views regarding the abilities, success, and failure of their students in terms of this prompt. This task enables detection of successes and difficulties affecting the development of analogical reasoning. In the last section of the questionnaire, respondents are invited to submit some examples of useful analogies and describe their views and experience in terms of the usage of analogies in their work.

In addition to the questionnaire, a group interview protocol was developed based on the phenomenological approach within a paradigm of critical constructivism (Goodman, 2008). A qualitative research interview seeks to cover both a factual and a meaning level, though it is usually more difficult to interview on a meaning level (Kvale, 1996). The interview protocol includes five open-ended questions reflecting the research objectives that were generated following a review of the relevant literature. The main areas of the interview plan address aspects of the usage of analogies, experience about the successful usage of analogies, suggestions for the efficient implementation of analogies in class, beliefs and attitudes towards analogies as a tool for development of transfer skills, the context of contemporary physics education, and self-evaluation. The interview plan was piloted with Master programme students enrolled as emerging physics teachers; no major edits were deemed necessary.

The analysis for the data from the questionnaire and the interview transcripts was based on the principles of quantitative and qualitative methodology. Quantitative data from Part 2 of the questionnaire was processed by polling the answers and calculating
their percentage. Content analysis was utilized for the qualitative data from Parts 3 and 4, as well as the interview transcripts. Appropriate textual units (phrases, sentences, or entire text of written answer) conveying a theme or idea were identified for coding. Similar cases were clustered in groups and appropriate language was chosen to describe the emergent categories. The interview data was triangulated with the data from the teachers’ questionnaire.

Sample and Procedures

The sample can be divided in two segments. Physics teachers (N = 35; 21% male, 79% female) from Latvian schools were surveyed. The age of participants ranged from 27 to 64 years, their pedagogical experience span from 4 to 40 years with a mean average of 23 years. The participants represented three of the four historical and cultural regions in Latvia: Latgale, Vidzeme and Zemgale. During the data collection from this first segment of sample, the questionnaire data were obtained in electronic form. Participation was voluntary; the teachers were informed about the aim of the study and assured as to the confidentiality and anonymity of their responses prior to administration of the questionnaire.

Independent of the questionnaire, three group interviews with six physics teachers each (N = 18; 33% male, 67% female) were undertaken. The second segment of sample, 18 teachers, was involved in the study as part of an in-service teacher training course facilitated by the author. Participants gained information about analogies in general, the role of analogical thinking in scientific investigations, prior research about the use of analogies in scientific investigation and science education, and the methodology of the FAR model. After the lecturer’s presentation, the teachers gathered in small groups to share their experience, to illicit examples of analogies and the methods associated with their usage. Participants discussed advantages and disadvantages of this approach. Teachers were informed about the aim of the group discussion and demographic data was collected, as well as some examples of analogies. Later, according to the interview plan, teachers were asked about their views, experiences, beliefs and attitudes towards analogies as a tool for development of transfer skills. The interview with each small group lasted approximately 40 minutes. All the interviews were audiotaped and transcribed to facilitate coding. Depending on the nature of data, appropriate quantitative and qualitative data analysis methods were applied.

Collaboration between the researcher and the teachers during the interview fosters self-reflection on the teachers’ personal and professional development. This alliance allows for creative organisation and navigation of the processes where the interviewees can independently construct a unique critical discourse on personal and societal levels. For the researcher, it only remains to evaluate how close these reflections are to the essential principles of sustainability and formalised requirements for ESD competences (Pipere & Mičule, 2014).

Results and Discussion

The results of the study will be presented in four sections according to the research questions and, where possible, compared with the results of prior research. The study investigates: 1) What are the views of physics teachers on the use of analogies? 2) What
types of analogies do they use? 3) How do physics teachers evaluate their students’ achievement in relation to analogical problem solving? and 4) What are the main aspects of the usage of analogies during physics instruction? We begin with a summary and analysis of the empirical data presenting the teachers’ views on using analogies. Next, we highlight the types of analogies collected; then summarize the evaluation of the students’ analogical problem solving skills. Finally, aspects of the usage of analogies as compiled are presented.

Teachers’ Views on Using Analogies

The data show that the majority of the participants sometimes use analogies in class as evidenced by the responses to the questionnaire’s items as well as by the teachers’ statements during the interviews. Table 1 summarises the empirical data from Part 2 of the questionnaire. Since the study engaged a small number of teachers, the results can be considered representative solely for the given group of teachers.

Table 1
Physics Teachers’ Views on the Use of Analogies in Physics Teaching (N = 35)

<table>
<thead>
<tr>
<th>Item</th>
<th>A Count</th>
<th>RA N Count</th>
<th>RD D Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1. During physics lessons, I sometimes use analogies consciously</td>
<td>8</td>
<td>14 2 6 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 23</td>
<td>40 6 17 14</td>
<td></td>
</tr>
<tr>
<td>Item 2. More frequently I use analogies consciously rather than when they arise spontaneously</td>
<td>9</td>
<td>9 2 11 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 26</td>
<td>26 6 31 11</td>
<td></td>
</tr>
<tr>
<td>Item 3. I encourage students to analyse analogies contained in textbooks</td>
<td>3</td>
<td>14 4 14 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 9</td>
<td>40 11 40 0</td>
<td></td>
</tr>
<tr>
<td>Item 4. I think that analogies help students to imagine and understand directly perceived objects or processes</td>
<td>22</td>
<td>13 0 0 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 63</td>
<td>37 0 0 0</td>
<td></td>
</tr>
<tr>
<td>Item 5. I think that analogy contributes to the development of imagination</td>
<td>7</td>
<td>25 2 1 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 20</td>
<td>71 6 3 0</td>
<td></td>
</tr>
<tr>
<td>Item 6. I think that analogy contributes to understanding of abstract concepts or indirectly perceptible processes</td>
<td>22</td>
<td>10 1 2 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 63</td>
<td>28 3 6 0</td>
<td></td>
</tr>
<tr>
<td>Item 7. Analogy sometimes diverts attention from the main concept or misleads students</td>
<td>3</td>
<td>12 6 9 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 8</td>
<td>34 18 26 14</td>
<td></td>
</tr>
<tr>
<td>Item 8. Visualisation of analogy is more effective than just the process of negotiating</td>
<td>15</td>
<td>18 0 2 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 43</td>
<td>51 0 6 0</td>
<td></td>
</tr>
<tr>
<td>Item 9. If the teacher uses analogy in an explanation, the students reiterate it in their answers or discussions</td>
<td>2</td>
<td>4 0 16 13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 6</td>
<td>11 0 46 37</td>
<td></td>
</tr>
<tr>
<td>Item 10. Purposeful use of analogies develops the ability to apply knowledge to new situations, develops transfer skills</td>
<td>19</td>
<td>16 0 0 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% 54</td>
<td>46 0 0 0</td>
<td></td>
</tr>
</tbody>
</table>

Note. A – agree, RA – rather agree, N – neutral or no answer, RD – rather disagree, D – disagree
The results reveal that approximately half of respondents use analogies consciously rather than they arise spontaneously. This is consistent with the conclusion by Cruz-Hastenreiter (2015) that during teaching activities the use of analogies is deliberate and can be planned to promote analogical reasoning development. Some respondents encourage their students to analyse analogies contained in textbooks and, in their explanations to students, some teachers use analogies both consciously and spontaneously. Nevertheless, approximately half of the sample (51%) does not draw students’ attention to analogies that are contained in textbooks. Overall, analysis of analogies included in textbooks can enable a deeper understanding of their role in the comprehension process and, especially for young teachers, to improve analogical reasoning and transfer skills for their students.

Responses from the questionnaire are consistent with the interview responses on this issue and this coherence confirms the validity of answers, providing data triangulation. During the interviews, the teachers expressed both positive and negative opinions in relation to the use of analogies which, in general, correspond to the data presented in Table 1. The interviewed teachers recognized that the main factors to consider while preparing a lesson include: where an analogy will be used, students’ familiarity with analogy, students’ background knowledge and the ability to compare and transfer features from one object to other. Tregast and colleagues (1998) point to similar factors: the degree of difficulty of the topics, the degree of novelty, prior knowledge of students, and familiarity with the analogy.

Furthermore, the respondents agree (63%) or rather agree (37%) that analogies can help students to imagine and understand indirectly perceptible objects and processes. Several other studies highlight the potential of analogy in the teaching and learning of science, primarily of concepts with a higher degree of complexity (e.g., Duit, 1991; Glynn, 2008; Harrison & Treagust, 2006). For example, Glynn (2008) notes that science teachers at all grade levels frequently use analogies when explaining fundamentally important concepts.

The large share of those responding “rather agree” or “rather disagree,” as well as missing answers, suggest that these teachers have little experience with analogies or they are not completely confident about this pedagogy. Such answers were obtained for the statements: “More frequently I use analogies consciously rather than when they arise spontaneously”, “I encourage students to analyse analogies contained in textbooks”, “Analogy sometimes diverts attention from the main concept or misleads students”.

It should be noted that the use of analogy does not always yield a positive effect. Several teachers indicated that analogy sometimes diverts students’ attention from the main concept or misleads students. This is also mentioned in other studies (Aubusson et al., 2009; Dilber & Duzgun, 2008; Duit et al., 2001). Some students only remember the analogy and not the content under study; other students focus upon extraneous aspects of the analogy and draw spurious conclusions about the target concept. In these cases, understanding of the new concept would be more successful without the use of analogies. At the same time, according to Cruz-Hastenreiter (2015), analogies allow for insights and highlight students’ misconceptions. One teacher mentioned that after watching video “Nanotechnology” where atoms were shown as the small yellow balls, some students perceived this analogy directly; consequently, in the test situation, they characterized the atom as a small yellow tennis ball.
Respondents agree (54%) or rather agree (46%) that the purposeful use of analogy develops students’ ability to apply knowledge to new situations and assists development of transfer skills. Similar conclusions can be found in various publications. When analogies are effective, they readily engage students’ interest and clarify difficult abstract ideas (Harrison & Coll, 2008). Concrete analogies facilitate understanding of abstract concepts by pointing to similarities between objects or events in the students’ world and the phenomenon under discussion (Aubusson et al., 2009). Cruz-Hastenreiter (2015) emphasizes that analogies lead to the activation of analogical reasoning, organize perception, develop cognitive skills such as creativity and decision making. Analogies make scientific knowledge more intelligible and plausible, facilitating the understanding and visualization of abstract concepts and, moreover, they can promote student interest. Use of analogies is a powerful and effective tool in order to contribute to the process of conceptual change. In general, the majority of the teachers recognized that purposeful use of analogy is a good method in teaching abstract science topics.

**Types of Analogies**

Approximately 85% of the surveyed teachers have mentioned at least one analogy; 27% – two or three analogies. The majority of the analogies were presented in verbal form; in four cases, the teachers listed their analogies as physical formulae. Overall, the teachers provided a total of 22 examples of analogy. Most of the teachers proposed analogies using physical objects, for instance, to illustrate the similarity between the atom model and the solar system, the Earth and an egg, a power source and a pump, electrical current and the water flow in pipes, mechanical pendulums and oscillation circuits, sound and electromagnetic waves. Teachers also named analogies using physical processes, such as free-electron movement in metals compared to a hurdling athlete, an electric current and the flow of a crowd of people, electrical oscillations and mechanical fluctuations. Brown and Clement (1989) emphasize that teachers more frequently use bridging analogies, analogies between well-known structures, objects or processes and novel scientific phenomena, such as the latter examples. These bridging analogies provide students with a platform from which to develop inferences and to prompt conceptual change, moving from one’s original ideas about a target phenomenon to reformulate them based on comparison with the source.

A majority of analogies (70%) mentioned by the teachers can be found in physics textbooks used in Latvian schools, such as the similarity between an electric current and the flow of automobile traffic. However, few of these analogies are innovative; for example, the effect of radioactive emission on cell membranes can be pictured as a stone thrown against the window. Alternatively, a teacher could encourage students to analyze and evaluate the impact of radiation in varied situations, including human body cells, health, workability, well-being. Another creative analogy involves the comparison of two processes: tapping by a hammer on the stone can cause sparks and, similarly, solar wind particles striking on atmospheric particles result in a fixed wavelength radiation which may occur as a gorgeous nature phenomenon known as the northern lights. This phenomenon is distinctly illustrated in Einstein’s conclusion on the association of mass and energy as well as cause-and-effect relationships.

Studies (Dilber & Duzgun, 2008; Glynn, 2008; Kim & Ryu, 2001) have found that electric current is very difficult for students to understand and that it is very hard to
change the students’ alternative ideas about electric current into scientific ones. Consequently, electric current is taught mostly through the use of analogies to elementary and secondary school students. Furthermore, the studied teachers included a large number of analogies related to electricity. During the group interview, the experienced teachers shared their experience with teaching the concept of electrical resistance. One teacher offered the analogy where the power cord is imagined as a long corridor with chairs located in some placement; each layout of chairs may be different, just as the atomic arrangement of metal crystal lattice varies. In addition, the experienced teachers pointed out that it is important to rethink the strategy to create a “bridge” between the known and the new concept, sometimes by including real models and by involving students in role-play. Based of the popularity of informational technologies, approximately half of the interviewed physics teachers use a variety of animation analogies that are easy to create or user-friendly. Kim and Ryu (2001) infer that animation analogy is more effective than pictorial or verbal analogy for developing students’ understanding of rather difficult concepts, particularly those associated with electricity.

Some of the teachers admitted that, in their practice, they intuitively use the Focus–Action–Reflection approach (Treagust et al., 1998) when they teach concepts such as electric and gravitational phenomena, similarity and differences between electric current and water flow, mechanical and electromagnetic waves and their properties. Brown and Clement (1989) stress that it is necessary to engage the student in the process of analogical reasoning in an interactive teaching process rather than simply present the analogy in text or a lecture.

Several teachers acknowledged the formal analogy associated with the similarity of physical equations or laws, although the physics textbooks do not emphasise this analogy. For instance, storing energy in a capacitor is like stretching a spring and Coulomb’s law is like Newton’s law of gravitation. Furthermore, Dilber and Duzgun (2008) have indicated that Coulomb’s law is often taught in introductory courses as analogous to Newton’s law of gravitation. Electric current is often likened to water flowing through a pipe. These authors conclude that analogies were helpful for learning abstract and complex concepts of electricity. Emphasising structural similarities and differences between the physical quantities included in a formula is, consequently, left to the decision of teachers. According to some teachers, emphasising the similarities of the formulae facilitates their memorisation.

The view of several teachers was that the majority of students do not want to devote time and effort to understand the essence of a new topic; these students would rather rely on the fact that, in case of need, they will be able to find the required information. Some teachers emphasized that the majority of students are not motivated to learn physics; some mentioned that the students’ lack of background knowledge is problematic. Consequently, the interviewed teachers acknowledged that they cannot pay sufficient attention to the development of analogical reasoning or take time to develop the necessary background knowledge.

Evaluation of Students’ Analogical Problem Solving

In a National Sample of Physics Programme (Izglītības satura un eksaminācijas centrs [Curriculum Development and Examination Center], 2008) one of the deliverables for students was to establish a visual aid comparing the gravitational and electric field
by analyzing and evaluating given information (p. 21). The main focus of this task was to observe similarities between two physics laws, as well as to consider some concepts, formulas and models. In Part 3 of the questionnaire the teachers were asked whether the execution of this exercise, requiring analogical thinking and problem solving, provides an opportunity to evaluate students’ transfer skills. Content analysis of the teachers’ comments reveals three main aspects of this issue: 1) organisation of students’ training in terms of this task, 2) procedural and transfer skills of students and 3) students’ understanding of the basic concepts corresponding to the theme.

Several comments emphasise the organisational aspect of the learning activity; for example, one teacher shared that if students receive a worksheet with a clear formulation of the task and key words and have access to the relevant literature, majority of students can complete this exercise or execute at least the part of it. Such comments indirectly suggest that there are students who are hesitant to tackle broader-scale tasks independently. Other teachers indicate that if the teacher guides the students in their work step-by-step, by asking questions or by giving directions, then this task for the student becomes feasible. Some teachers indicated that only a few students are able to perform this task independently; this fact points to the usefulness of the FAR model. The importance of motivation and organisation of the learning process to achieve results was also mentioned during the group interviews.

In assessing the procedural skills of their students, the teachers highlighted several issues and commented that:

- Students have difficulties to compare, discerning the similarities and differences, to analyse and to draw conclusions (n = 11);
- Students have problems with performing comparisons (n = 9);
- Students do not know how to begin solving the task (n = 1);
- Students are unable to think by analogy (n = 1);
- Students do not know how to think “globally” (n = 1).

These comments clearly display the recognition of the lack of students’ procedural skills, including analogical reasoning and transfer skills. This suggests that a large proportion of teachers do not pay sufficient attention to the development of analogical reasoning while teaching physics. Teachers also indicated shortcomings with regard to prior physics content knowledge:

- Only a few students remember the law of gravity and are able to see the similarity with the Coulomb’s Law;
- Students quickly forget what was previously learnt, so before tackling this task it is necessary to revisit about the gravitational field and its related concepts.

Furthermore, some teachers concluded that the majority of secondary school students are unable to identify deeper similarities between two different phenomena, gravitational and electrostatic interaction, probably because the tasks with such content are performed rarely.

It may be presumed that sufficient attention is not given to a comparison of physical phenomena. In this context, Dilber and Duzgun (2008) highlight that while using analogical instruction, analogies should address the correspondence of its attributes and relationships between the target concepts in order to make the connections more explicit. Moreover, a science teacher should become familiar with their students’ difficulties in understanding scientific concepts. A majority of the respondents (74%) recognised that
at the end of secondary education, most students have insufficiently developed analogical reasoning. The fact that the Latvian secondary school students’ analogical reasoning and transfer skills are not cultivated on a sufficient level is evidenced by the results of the centralised examinations in physics, chemistry and biology.

Students have difficulties with tasks where creative application of the acquired knowledge and skills in a novel situation is required, for instance, transferring the principles of natural systems to technological constructions. Similar results are displayed in OECD research (Geske, Grünfelds, Kangro, Kiselova, & Mihno, 2013) where a relatively small number of 15-year-old students have high achievement in reading, mathematics and science; only 0.1% of the students were able to perform tasks of the highest level of difficulty. On average, across OECD countries, the highest level of competence was attained by 0.8% of students. Therefore, it is important to determine the reasons for such results. This study revealed some potential sources of acknowledged shortcomings.

For instance, when asked about the main features of physics teaching/learning in secondary school, teachers admitted that in recent years, since the new physics curriculum was implemented in 2008, there are other priorities, including laboratory research, development of students’ research skills and teaching to use IT for extraction of information, data storage and processing, as well as for acquisition of the fundamental physics concepts and understanding of physical phenomena. Besides, as their primary task, teachers often focus on preparing those students who opt to take state examinations. The teachers also acknowledge their students’ lack of motivation to fully understand the essence of ideas and are frustrated by the majority’s unwillingness to struggle to reach high educational achievements.

Is it necessary to promote the development of analogical reasoning in the physics teaching/learning process? The teachers gave an affirmative answer to this question. There were two viewpoints: some teachers expressed the idea that, in the practice of choosing the tasks, teachers more often have to focus on mid-level students so they do not always have time to cultivate analogical reasoning and other high-order thinking skills. In contrast, some teachers emphasised the importance of using analogy for the development of reasoning; when their students identify an analogy, they show satisfaction with their ability to perceive it and to easily understand the associated new construct. A similar conclusion was reached by Richland and Simms (2015): when participants identify that they should be making an analogy, they often appear competent and are able to draw and benefit from key higher order structural mappings.

One teacher noted that physics by its nature is an analysis of real-life situations and experimentation, creation of models and analogies and their interpretation on the grounds of previously discovered laws of nature. Physics has to be learnt if only just because it teaches people to think. ... And everyone needs to think, judge and analyse in their lives.

Dimensions of the Usage of Analogies

When analysing the group interview transcripts, attention was paid to the dimensions of the usage of analogies. Four themes were distinguished and summarised in Table 2. The variety of examples mentioned by the teachers suggests that teachers are familiar with the aims for the usage of analogies.
Table 2
Dimensions of the Usage of Analogy: Physics Teachers’ Views

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Specific aims</th>
</tr>
</thead>
</table>
| Development of an initial understanding of a concept, idea or process | To generate momentum for acquisition of the topic by activating students’ experience  
To build on prior knowledge and understanding of a target concept  
To organise students’ thoughts about a concept |
| Visualisation of an abstract concept             | To develop a picture or models of abstract substances  
To visualise indirectly perceived objects or processes |
| Information for switching “thinking”             | To provoke thought triggering memories  
To promote thinking when students get into a deadlock  
To refresh students’ minds with information from real life |
| Memorization or rephrasing of terms or operations | To determine the meanings of physics terms (such as capacitor, transformer, convection, etc.)  
To stimulate certain operations |

During the discussion, the teachers came to the recognition that analogies should be taught by methods that evoke students’ intuition and spur them to apply their prior knowledge and reasoning skills to solve unfamiliar problems. With regard to the methods of analogy use, three main insights from the teachers’ interviews indicate that:

1) Analogy should be correct and accurately phrased: Analogy must be correct in order to prevent misconceptions of not directly perceived processes, and not too primitive, because a primitive analogy does not catch students’ attention;

2) Objects or physical processes must be confronted with real life objects or processes or prior knowledge or skills: For students it is easier to learn something new if it is compared with their prior knowledge. Analogies from life are sometimes very helpful in inspiring imagination. They create associations and it becomes easier for students to understand a new concept.

3) There is a need to compare the analogue and target object or process: The fact which we take as clear and understandable, for instance, when analysing the operation of pump and power source in electric circuit, is far from clear and understandable for students. So, step-by-step, we need to analyse what is similar and what is not, because students often take only part of the idea – “pull” it out of the context and thus develop their misperceptions.

Therefore, to promote secondary school students’ analogical reasoning, it is important to explain the basic properties of the analogue to enable an analogical transfer that is correctly established between the analogue and a target. Description of the analogue and the discussion of the strategy help to direct students toward focusing on suitable features for the analogical transfer.

When describing their own analogical reasoning, several teachers recognised that their ability to facilitate analogical thinking has developed in the course of their teaching career. In particular, physics as a subject is appropriate for demonstrating a way and means to arrive at new conclusions on the grounds of prior knowledge and experience
in order to promote analogical reasoning and transfer skills development. Richland and Simms (2015) conclude that analogies are regularly used in both textbooks and classroom discourse, though there is converging evidence that acquisition of complex, integrated relational systems of knowledge within science cannot happen without explicit instructional support. This may take many forms, including direct instruction, scripted analogy activities, or carefully designed technologies for promoting knowledge integration.

Conclusion

In this study, the methodological tool for the development of transfer and analogical reasoning in physics teaching/learning was analysed from theoretical and empirical points of view and in different contexts. There is a consensus that, in the context of sustainable development, 21st century education should prioritize students’ skills for higher order thinking, analogical transfer and flexible reasoning over memorization of facts. Analogy as a learning tool provides analogical reasoning, which can be seen as an important learning outcome. Such pedagogy raises new challenges for researchers, curriculum developers, teachers, teacher educators and authors of teaching aids; effective implementation asks for a more systemic approach, as well as more extensive studies to inform instruction and support in-service teacher training.

The teacher and his/her competence have a significant impact on the quality of ESD. A physics teacher should be able to contribute to their students’ analogical thinking. According to this study, teachers’ repertoire of analogies is primarily derived from textbooks; therefore, authors of textbooks should be careful to include appropriate information and tasks that promote analogical thinking.

A majority of the teachers believe that purposeful use of analogy is a good method for teaching abstract science topics. But there is little empirical evidence to demonstrate that drawing students’ attention to the development of analogical reasoning and transfer skills can contribute to their awareness regarding the interconnectedness of physics knowledge with social, environmental, and economic issues. With regard to the methods of analogy use, three major insights indicate that: 1) analogy should be correct and accurately phrased; 2) target objects or physical processes must be compared with real life objects or processes or prior knowledge or skills; and 3) there is a need to explicitly compare the analogue and target object or process. Teachers’ professional competences in terms of these recommendations can be improved only by continuous and systematic professional development, as well as by engagement in reflective activity.

Further research is required to understand how analogies can facilitate the comprehension of complex physics concepts, how to develop analogical reasoning and how to embrace the relationships between physics, laws, environmental, economical and social issues. The analysis of insights and views collected from educational researchers and experienced teachers is an important step toward the improvement of methodology of physics teaching and teacher education in the context of sustainable development.
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Innovative and Traditional Elements in the Work of Academic Staff: The Views of Pre-service Teachers

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Abstract

The academic staff of the institutions of higher education plays a key role in the implementation of innovations in the study process. This article aims to analyze the views of students, pre-service teachers, on the role of innovations and traditions in the work of the academic staff at their institution of higher education. The survey data from 192 full-time and part-time first year students at Riga Teacher Training and Educational Management Academy show that readiness for innovative activity and active involvement in the creation, acquisition and implementation of innovations is an essential factor in the work of the academic staff. The results indicate that according to the views of pre-service teachers, in the context of pedagogy, the term ‘innovation’ refers to the process of renewal, educational reforms, selection of the most appropriate teaching material, and the elaboration, adoption and utilization of innovations in the pedagogical practice.

Keywords: pre-service teachers, innovation, tradition, academic staff, higher education

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In the 21st century, each individual and the society as a whole have to learn to live in the constantly changing environment, to coexist with changes and to make change themselves. Along with the shift in the educational paradigm, significant transformations take place in educational systems. The policy planning documents of the Republic of Latvia state that individuals with their knowledge, wisdom and skills, as well as the willingness to actively cultivate and apply them, are Latvia’s main resource on the way towards the knowledge society. These documents emphasize that “the extensive and deep high-quality knowledge, together with the human capital, is a precondition for the eco-system of innovations to create new knowledge” (The Cabinet of Ministers of the Republic of Latvia, 2013, p. 43).

Knowledge is becoming the main driving force for the development in all areas of human activity. Therefore, it is very important to reform the system of education so that it could meet the increasing demand for new knowledge. Investing in human capital
Innovative and Traditional Elements in the Work of Academic Staff...

In the knowledge driven society actually means creating not only new knowledge, but also new marketable and competitive products or services, thus enhancing the well-being of the whole society.

Within the model of the learning society, innovations in education can be applied to change human thinking, the understanding of values, and to erase the boundaries between the formal and informal education. The notion of the knowledge society is closely linked with the development of information and communication technologies, though the wide use of digital technologies in education poses new challenges (Kapenieks & Salīte, 2012; Woods, 2002). Besides, technologies lead to changes in human thinking and perception (Prensky, 2001).

Nowadays, the issues concerning the innovative ability of the institutions of higher education are more topical than ever before, both in Latvia, Europe, and the whole world. However, there are comparatively few studies concerning transformations in the Latvian institutions of higher education (Gedžūne, 2014; Lukjanska, 2014; Tisenkops, Bela, & Kunda, 2011), and they mainly deal with the analysis of structural changes within these institutions. The issues regarding the innovation processes underlying the changes and the realization of the diverse roles of educational institutions, as well as students’ views on the implementation of innovations in educational institutions have been studied much less.

The changes in the system of teacher education toward sustainability are among the possibilities to change the educational system in Latvia. The essence of sustainable higher education is to ensure individual’s ability to adapt to the conditions of the changing environment, to prepare people for professional activity in the information society, and to create opportunities for everyone to develop himself/herself creatively (Grabovska, 2006).

The refocusing of education toward sustainability is particularly topical in teacher education since teachers are entrusted with the responsibility to take care of young people – the new link in the chain of the evolution of human consciousness (Fried, 2006; Grabovska & Grabovskis, 2009; UNESCO, 2005). In scientific literature, the goals of teacher education are linked with the attempts to help would-be teachers reach sustainability, i.e. inclusive wisdom (Salīte, Gedžūne, & Gedžūne, 2009). The refocusing of students – pre-service teachers toward the aim of sustainability also includes the issue of innovations in the process of studies.

However, the system of higher education in Latvia, including professional teacher training, shows some contradictory elements. Undoubtedly, the academic staff working in the institutions of higher education ensures the passing of knowledge, skills and values on to the new generation (Baltušīte, 2012; Mūrnieks, 2010). Nevertheless, according to a number of studies, the active involvement in the creation and acquisition of innovations, as well as the use of innovations in the study process is not observed on a regular basis in the work of the academic staff at the institutions of higher education (Baltušīte, 2012; Brīgmane, 2014; Kunda, 2014; Kapenieks, 2013). With regard to the quality of higher education in Latvia, particular attention is paid to the issues concerning teaching methods, technological provision, and the possibilities of information and communication technologies, while the focus on the key subject – the student – is not sufficient (Kapenieks, 2013; Lapiņa, 2007; Stankevičs, 2015).

What is the students’ attitude toward innovations and traditions in the study process and what do they expect from the studies? Are students oriented towards innovative
activity? Are the relationships between the students and teachers based on mutual interest and collaboration, and what is necessary to improve them? What is the role of the personal qualities of the academic staff in the study process? These are the key questions, the answers to which can be found through the reflection and self-report study of pre-service teachers.

Therefore, the purpose of our study was to analyze the views of pre-service teachers on the manifestations and the role of traditions and innovations in the work of the academic staff at their institution of higher education.

### Theoretical Background

Along with the paradigm shift in education in the new social and economic conditions that mark the last decades for the society of Latvia, there has appeared the need to bring to the foreground the issue concerning innovations and traditions in education.

According to Robinson (2011), a paradigm is a generally accepted framework of a set of rules and considerations which determines progression and the way something is done. At present, all philosophical approaches recognize the transition to a new global paradigm where people are participants in common research (Reason & Bradbury, 2008). This has been referred to as an evolution in philosophical thinking. Essentially, a shift in the way of thinking is a paradigm shift. As one of the global paradigms, the paradigm of the knowledge society has a direct impact on the development of research in many disciplines, including pedagogy (Kapenieks, 2013; Lapina, 2007; Stankevičs, 2015).

The notion of ‘innovation’ has been derived from the Latin word *innovare*, which means “to renew or change”; consequently, innovation is something new – an idea, a practice, or an object. However, being new is not an end in itself; it is something that makes it possible to reach an aim of a particular social entity in a more successful, effective, and economical way than something “old”; it stimulates productivity, competitiveness, survival (Alange, Jacobsson, & Jarnehammar, 1998), constant renewal and the preservation of vitality (McKenzie, Aleksander, Harper, & Anderson, 2005). The chief business of traditional education is to transmit to the next generation those skills, facts, and standards of moral and social conduct that adults consider being necessary for the next generation’s material and social success (Dewey, 1938).

Studies concerning innovations and traditions have been carried out in various disciplines – culture, economics, and social sciences. In the present study, the authors have tried to present the analysis of the understanding of these concepts in the field of higher education. With regard to the innovative and traditional aspects of higher education, it is important that universities are able to adapt to the new reality of knowledge creation, which is essentially different from the traditional way of knowledge creation and implementation in the existing institutional framework.

Starting from the 1980s, innovations and changes have become the key notions in the policy and practice of higher education in the West (Silver, Hannan, & English, 1997). At universities, innovation was regarded as an instrument to ensure legitimacy and survival adapting to changes in the environment (Stensaker & Norgard, 2001). According to Silver and his colleagues (1997), innovation has to be regarded as a planned process at the university during which changes are introduced in order to make improvements or to solve or minimize some practical problems. This definition is very neutral
Innovative and Traditional Elements in the Work of Academic Staff.

and can suit any environment. It implies the procedural character of innovations, their purposefulness, the focus on improvement, and the solution of a problem.

According to the studies, innovations can take place within the framework of all the traditional roles of universities – the process of studies, research, and social engagement (McKenzie et al., 2005; Shattock, 2008). Nevertheless, a considerable part of innovations is searched for and found with regard to the process of studies, thus confirming that the provision of higher education is the main (or most visible) contribution of the institutions of higher education to society. There have to be pointed out discussions concerning the degree of innovations, which directly refer to the issue of new solutions and the ability to find legitimacy in the practice of a particular organization.

In scientific literature, two degrees of innovations – the incremental (gradual) and the radical one (Brunori, Berti, Kleikx, Tisenkopfs, & Rolp, 2011) have been singled out. Incremental innovations can be introduced with a few changes in the existing organizational practice; they fit in the context of the current norms and values, while radical innovations require major changes both in the institutional practice and the norms and values (McKenzie et al., 2005). A radical innovation disrupts the existing practice and contradicts the institutionalized understanding of what is acceptable, appropriate, and desirable (Van Dijk, Berends, Jelinek, Romme, & Weggeman, 2011). Nevertheless, it has been pointed out that radical innovations are also possible in stable and distinctly institutionalized environments (Zietsma & Lawrence, 2010). All in all, the scholars point out, that incremental innovations dominate in the institutions of higher education (McKenzie et al., 2005; Silver et al., 1997).

Within the context of the present study, the characteristics of top-down and bottom-up innovations and their role in the institutions of higher education, i.e. the origin of initiatives related to innovations and their direction, will be considered in the interpretation of the results. The majority of studies concerning the changes in universities tend to consider top-down innovations, i.e. changes proposed by formal administrative structures.

Since 2009, an intensive discussion has been going on in Latvia concerning the quality of higher education. There have been proposed political reform initiatives that envisage changes in administration and management. At present, as far as the creation of innovations is concerned, initiative is primarily associated with formal power positions. A comparatively small number of empirical studies are devoted to the analysis of bottom-up innovations. In the institutions of higher education, innovations are associated with harsh competition, tension, and acute necessity to deal with financial problems rather than creativity and individual enthusiasm (Kunda, 2014; Stankevičs, 2015).

The positive outcomes of bottom-up innovations discussed in the theoretical literature are due to a greater variety of solutions initiated by various stakeholders (Kezar, 2012) as well as incremental improvements of the existing practice (Cummings, 2005) like improvements in the curricula and student-teacher interaction. As far as the survival of universities is concerned, bigger hopes are linked with improvements in interaction, expecting that new methods can improve the quality of studies and reduce the needed effort at the same time. Innovations concerning the process of studies and interaction can manifest themselves as the use of technologies, the creation of particular skills, the use of teamwork, e-learning, mentoring, etc. (Hannan & Silver, 2000). A comparatively smaller number of studies have been devoted to innovations and traditions in the work of academic staff at the institutions of higher education.
In the studies concerning competencies, it has been emphasized that in the future the most demanded professions will be those requiring competencies for innovative activity (CEDEFOP, 2008). It is particularly important for the work of the academic staff at the institutions of higher education.

The authors have identified several studies on the innovations in the field of pedagogy (Kapenieks, 2013; Kettunen, Kairisto-Mertanen, & Penttila, 2013; Lapiņa, 2007). The innovation capacity of an innovative specialist – a university teacher – can be characterized by his/her competence to create, develop, and commercialize new competitive products (Lapiņa, 2007). According to Lapiņa (2007), the individual’s innovation capacity is determined by three factors: specific personal qualities, theoretical and professional knowledge in a particular field, and the environment favorable to innovations or innovation culture.

The notion of the knowledge society cannot be separated from the development of information and communication technologies. Technologies play a decisive role in students’ lives; they can make the learning environment more innovative and creative. The skills of students and educators, together with the educational systems based on new technologies, create a new learning culture focused on learners’ needs (Ferrari, Cachia, & Punie, 2009; Prensky, 2005). The sustainable use of technologies provides opportunities for a creative study process, facilitates the possibilities of knowledge creation, expands the possibilities of cognition, as well as the engagement and motivation of users (Kapenieks, 2013). The application of new information technologies in the process of studies is one of the most essential elements of the innovative activity of the academic staff.

Studies on the educational practice of academic staff also bring to the foreground the issue concerning the interaction of traditional and innovative teaching methods in the study process. With regard to a student survey about the possibilities of using the lecture as a traditional teaching method, Cavanagh (2011) points out that students appreciate lectures that combine information given by a teacher with cooperative learning tasks, opportunities to work in small groups and have discussions. The other study (Miller, McNear, & Metz, 2013) shows that students’ participation in lectures combined with involvement in discussions and group work leads to better acquisition of information and understanding, higher interest and motivation, and better results in examinations.

The aforementioned issues have also been tackled in the studies related to higher education and teacher training in Latvia (Baltušite, 2012; Lapiņa, 2007). The institutions of higher education create the educational environment developing the readiness of future specialists for their professional activity. In the field of education such an activity comprises a set of qualities that can be accumulated as a result of positive experience, the inner potential of successful pedagogical activity, as well as the availability of resources for purposeful activity (Baltušite, 2012).

Therefore, considering all the above, pre-service teachers’ views are very important in order to understand the significance of innovative and traditional aspects in educating future teachers.

As was already mentioned, educators’ professionalism is a particularly important precondition for the successful development of any institution of higher education, also in the context of innovations and traditions. In order to gain a comprehensive idea of processes taking place at the institutions of higher education, our study was aimed at clarifying students’ views in two aspects:
• What are the students’ views concerning innovative and traditional elements in the work of academic staff at their institution of higher education?

• How do the students evaluate the role of teacher’s personality in the innovative process of studies?

Methods

Instruments

In order to clarify the students’ views on innovative and traditional elements in the work of academic staff at their institution of higher education, the authors designed two questionnaires containing questions regarding the students’ 1) orientation toward their own innovative activity and 2) attitude and expectations in relation to innovations and traditions in the process of studies. Also, these questionnaires intended to define 1) if the student/teacher relationships are based on mutual interest and collaboration, and 2) to establish the factors for the improvement of these relationships. The role of the personal qualities of teachers was also examined using these two instruments.

The questionnaires were created based on the theoretical guidelines (Kunda, 2014; Mūnieks, 2010) mentioned above, previous studies, and Latvia’s Guidelines for Science, the Development of Technologies and Innovations for the Period of 2014–2020 (The Cabinet of Ministers of the Republic of Latvia, 2013).

The questionnaires were designed to conduct an operational student survey that would give an overall impression of students’ views. The first questionnaire contains items that show the respondents’ views on innovations and traditions in the study process in general; the second questionnaire is intended for a more detailed exploration of the students’ views concerning the role of the academic staff in the study process. Generally, the items used in both questionnaires were questions with dichotomous answers (yes/no). In order to reflect the variety of respondents’ views, more detailed sub-questions were elaborated for the items of the second questionnaire. Some items of the second questionnaire were designed using 4-point Likert scale.

Descriptive statistics (frequency, mean, standard deviation) has been used for the initial analysis of the data. Pearson Chi-Square test ($\chi^2$) has been applied to evaluate correlations between two independent groups and two variables. Contingency coefficient ($\phi$) has been used to interpret the strength of correlation between two variables measured in the dichotomous scale.

Participants and Procedure

The participants of the study were 192 first-year students of Riga Teacher Training and Educational Management Academy (RTTEMA), pre-service teachers, enrolled both in the full-time and part-time studies in various specialization groups – the future primary school teachers, elementary school teachers, the teachers of dance and rhythmic, music teachers, and education managers. The number of the respondents is sufficient for statistical analysis, the sample represents various student groups and it can be considered as representative of the overall view of the 1st year students of RTTEMA. There were 185 women and 7 men among the respondents, 119 students participated in the first survey, with 58% full-time and 42% part-time students among them. The second questionnaire was completed by 75 full-time students.
The data collection was organized at the end of the academic year when the respondents had become acquainted with the academic environment at the institution of higher education. This is the time when students are open for discussions and various activities, and the new experience of students’ life creates the desire to exchange thoughts and critically evaluate the process of studies. The survey was conducted in the spring of 2014. All the respondents participated in the survey voluntarily. The responses were anonymous; the data have been used only in a processed form.

Results

The Innovative and Traditional Elements in the Process of Studies

According to the results of the first questionnaire, in general, the students are open to innovations in higher education; however, they believe that it is necessary to preserve the traditional aspect as well. The respondents’ views can be illustrated by the answers concerning the possible ways of introducing innovations. The questionnaire’s items with the highest degree of agreement or disagreement are represented in Figure 1. The numbers show that the majority of the respondents (71%) believe that it is necessary to introduce separate innovations while preserving the results achieved with traditional methods (item A3). A similar number of the respondents (72%) have given an affirmative answer to the question whether the administration of the institutions of higher education has to undertake responsibility for innovative activities (A5). However, a considerable number of the respondents (9% and 12% respectively) have not answered these questions, most probably due to their lack of experience. At the same time, there is a relatively high level of consensus among the respondents concerning the attitude of students and teachers to innovative processes at the institution of higher education, which were rated positively by 87% of the respondents (A10).

![Figure 1. Students’ views concerning the innovations and traditions in higher education](image-url)
Items A13–A15 (see Figure 1) characterize the students’ views on innovative activities showing their positive attitude to innovations in the process of studies and potential readiness to participate in them. It can be realized that more than 80% of the respondents would be interested in undertaking their own innovative activity: they are willing to participate in research projects and present their creative work at scientific conferences, which implies that the majority of the students see their innovative activity in the area of research work, and they are ready to engage in it. Comparing the questionnaire’s items in Figure 1, statistically significant differences can be identified only between the following statements: A13 and A14 ($\chi^2 (1, N = 89) = 6.19, p = .01$); A13 and A15 ($\chi^2 (1, N = 102) = 9.39, p = .002$); A14 and A15 ($\chi^2 (1, N = 109) = 14.11, p < .001$). As shown by the contingency coefficient, the correlation between the variables is moderately strong ($\phi = .30 - .36$). Thus, a number of students have no desire to get involved in the creation of the innovative learning environment or to participate in research activities. There are no statistically significant differences between the views of full-time and part-time students (Table 1).

Table 1
Comparison of Full-time and Part-time Students’ Views on the Introduction of Innovations

<table>
<thead>
<tr>
<th>Items*</th>
<th>Respondents (N)</th>
<th>df</th>
<th>$\chi^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>118</td>
<td>1</td>
<td>0.09</td>
<td>.77</td>
</tr>
<tr>
<td>A3</td>
<td>107</td>
<td>1</td>
<td>0.02</td>
<td>.90</td>
</tr>
<tr>
<td>A4</td>
<td>99</td>
<td>1</td>
<td>0.01</td>
<td>.91</td>
</tr>
<tr>
<td>A5</td>
<td>100</td>
<td>1</td>
<td>3.22</td>
<td>.07</td>
</tr>
<tr>
<td>A10</td>
<td>116</td>
<td>1</td>
<td>0.05</td>
<td>.12</td>
</tr>
<tr>
<td>A13</td>
<td>100</td>
<td>1</td>
<td>0.13</td>
<td>.71</td>
</tr>
<tr>
<td>A14</td>
<td>113</td>
<td>1</td>
<td>0.25</td>
<td>.61</td>
</tr>
<tr>
<td>A15</td>
<td>114</td>
<td>1</td>
<td>0.05</td>
<td>.82</td>
</tr>
</tbody>
</table>

* See items in Figure 1

Students recognize the role of new technologies in the process of studies and link the introduction of innovations to these technologies. For instance, 96% of the respondents have pointed out that it is important both for students and educators to receive information about new technologies and to find a possibility to acquire them. The students’ opinions about the introduction of innovations with the effective experience of the previous activity ($A1, M = 1.03, SD = .16$) and opportunities for talented students to present their creative work ($A15, M = 1.02, SD = .13$) are similar.

The Role of Teacher’s Personality in the Innovative Process of Studies

In order to explore the views of students on the role of the academic staff in the innovative process of studies, the respondents were offered a second questionnaire. The authors aimed to focus on the students’ opinions concerning their teachers as personalities, organizers, and managers of the study process, as far as it was possible for the students to get to know that in the course of one academic year.
The majority of the respondents (96%) believe that teachers play an important role in students’ lives. The students provided various answers to the question *How has the attitude of the society to the profession of higher education teachers changed?* Almost half of the respondents (44%) have no clear idea about the attitude of the society, while the third of the respondents (32%) think that the prestige of the teachers working at the institutions of higher education has increased (Figure 2). Responding to the question whether the teachers can be advisors for students, the respondents have generally given a positive answer; nevertheless, 5% of the respondents believe that a teacher cannot be an advisor for students (Figure 3). This view requires further research.

![Figure 2. Students’ views on changes in the societal attitude toward the teachers higher education](image)

![Figure 3. Students’ views on teachers being advisors for students](image)

When evaluating the personal qualities of the academic staff, 84% of the respondents appreciate educators’ professionalism, intelligence (72%), the ability to express their thoughts clearly, and persuasiveness (73%). Educators’ respectful attitude to students has also been given a high ranking by 71% of the respondents. Majority of the respondents (67%) impart the positive evaluation of the teachers’ interest in their subject and erudition. Small number of respondents suggests that their teachers are indifferent, haughty, or self-seeking (11%, 3%, and 14.7% respectively). On the other hand, only 20% of the sample has marked the teachers’ selflessness and belief in high ideals. Ranking the educators’ personal qualities according to the number of the respondents who have evaluated the particular quality positively, it can be seen that professionalism has obtained the highest rank (Table 2).

<table>
<thead>
<tr>
<th>Rank</th>
<th>Personal quality of academic staff</th>
<th>Number of respondents (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Professionalism</td>
<td>84</td>
</tr>
<tr>
<td>2</td>
<td>Ability to express one’s ideas clearly, persuasiveness</td>
<td>73</td>
</tr>
<tr>
<td>3</td>
<td>Intelligence</td>
<td>72</td>
</tr>
<tr>
<td>4</td>
<td>Respectful attitude to students</td>
<td>71</td>
</tr>
</tbody>
</table>

*Sequel to Table 2 see on p. 83.*
With regard to the evaluation of relationships between teachers and students, the dominant qualities are friendliness and mutual trust. Just a very small number of the respondents have observed the conflicting relationships in the academic environment (4%). Hostile relationships can also be regarded as an insignificant phenomenon since only 1% of the respondents characterize the relations between students and teachers in that way (Table 3).

Table 3

<table>
<thead>
<tr>
<th>No</th>
<th>The nature of the relationship</th>
<th>The number of affirmative responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Friendly</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Trusting</td>
<td>52</td>
</tr>
<tr>
<td>3</td>
<td>Indifferent</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Tense</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Conflicting</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Hostile</td>
<td>1</td>
</tr>
</tbody>
</table>

The respondents who consider teachers to be their **spiritual advisors** also notice the friendly relationships between teachers and students. The strength of the correlation is characterized as follows: $\phi = .37$ (\(\chi^2\) (1, N = 73) = 11.54, \(p = .001\)). There can also be observed the strong correlation between the views that a teacher can be a spiritual advisor and a teacher plays a very important role ($\phi = .33$; $\chi^2$ (1, N = 73) = 8.34, \(p = .004\)).

When evaluating the teaching activity of the academic staff in general, students had to answer two questions – *How does the institution of higher education train students for practical work at school?* and *How does the institution of higher education prepare students for competition in the labor market?* With regard to the teacher’s work at school, the respondents’ answers were as follows: excellent – 7%, good – 72%, average – 5%, poor – 2%, while 14% of the respondents have not been able to state their point. Being prepared for the competition in the labor market has been rated in a similar way:
excellent – 9%, good – 63%, average 6%, poor – 2%, while 20% of the respondents have not been able to give a definite answer.

Almost all the respondents involved in the survey (96%) believe that the curricula of the institutions of higher education have to be improved, while the remaining 4% have chosen the option hard to say.

Discussion

The results of the study give an overall impression of the views of the 1st year students concerning the role of innovations and traditions at their institution of higher education and their understanding of innovative processes. It has to be acknowledged that both full-time and part-time students have evaluated the introduction of innovations equally positively, since there are no statistically significant differences between both student samples.

Overall, the students have a positive attitude to the introduction of innovations in the study process. However, as to the ways of introducing innovations, they do not see the importance of bottom-up innovations (initiated by students themselves) and traditionally place the responsibility for introducing innovations on the administration of the institution of higher education. Although a similar situation is mentioned in the works of other authors (e.g., Kezar, 2012), it has to be admitted that the number of the supporters of top-down innovations is surprisingly large (72%) in view of the fact that in institutions of higher education innovations currently are an integral part of the study process. A view like this indicates the lack of enterprise and initiative among the respondents. Though, the individual behavior of a student cannot be explained without understanding the context of their life. Social conditions can create opportunities for the autonomous development of each individual, but they also determine the manner and the ways these individuals have to act. Individuals can perceive themselves as free and emancipated human beings; however, secondary agents (market, politics) affect their biography to a large extent (Beck & Ritter, 1992). The situation where students have to combine work and studies in order to obtain education reduces the time of their participation in initiating innovative processes at their institution of higher education.

The respondents express their support for the preservation of traditional teaching methods, but they also appreciate the introduction of novel methods. The majority of the respondents (71%) think that innovations have to be introduced gradually. The students emphasize the integration of innovations and traditions in the process of studies and point out that it is necessary to advisedly coordinate the introduction of innovations with the effective experience from the past. This finding coincides with other studies (Kunda, 2014; Miller et al., 2013). The dominance of incremental innovations identified in the study also corresponds with the conclusions found in other studies (Silver et al., 1997).

Some questions have presented difficulties to the respondents, where up to 15% of sample has not been able to give a definite answer (see Table 1). In contrast, the question concerning the attitude to the introduction of innovations has been very easy – almost 90% of the respondents have stated that the attitudes of both students and educators have to be positive.
As to the role of teacher’s personality, almost all the respondents (96%) recognize the important role of the academic staff in the study process. The innovation requires people who could promote them, develop ideas, and find their practical application. The promoters of innovations – teachers and students – have been referred to as the human factor of innovation (Lapiņa, 2007) fostering the implementation of new ideas that can bring positive changes in education like the development of new curricula, the introduction of new interactive teaching methods, and the training of innovative specialists for working life. The studies carried out by various authors indicate that innovative specialists are characterized by specific personal qualities, theoretical knowledge and practical expertise in their specialty and related fields, as well as the culture of innovation (Baranova, 2012; Koče, 1999; Lapiņa, 2007; Porter, 1998; Žogla, 2001). Hence, the shift in the role of the academic staff from the dominant role of experts in the traditional study process to the role of a guide, supporter, consultant, coordinator, and facilitator in a student-centered process of studies is observed (Žogla, 2001). In the context of the present study, it has to be mentioned that teacher’s presence is particularly important during the adaptation process of the first year students since it is the teacher who can recognize student’s abilities and needs and provide the necessary support (Odiņa, 2010).

In view of the fact that the respondents of the study had fresh memories from recently finished secondary school and they also have already drawn some conclusions during their first year of studies, the results of this research clearly show that students appreciate the professionalism (84%), intelligence (72%), and erudition (67%) of the academic staff. Besides, they rate as important those qualities that promote collaboration between the teacher and learners – respect for students, self-respect, and determination. Moreover, the students believe that teacher can be an intellectual leader. The results of the study also prove the previously expressed beliefs (Mūriņieks, 2010), that the contemporary higher education has not only the practical task of preparing people for working life, which is positively rated by the students, but it also performs the functions of humanization and acculturation. The study confirms the idea that collaboration is the means of implementing innovative pedagogy where an educator and learners are searching for the truth together (Kettunen et al., 2013; Mūriņieks, 2010; Tīļa, 2005). Therefore, the students rate negatively those personal qualities of the academic staff that do not promote mutual understanding in the study process, such as unwillingness to accept different opinion and indifference.

If we proceed from the thesis put forward by Gibbons and his colleagues (Gibbons, Limoges, Nowotny, Schwartzman, & Scott, 1994) concerning the implementation of a new socially extended, collaborative model of activity at the institutions of higher education, it is necessary to maintain a broader and multiform dialog between the administration of the departments, program directors, and students. It also implies playing in different fields (studies, research, and the circle of social agents), as well as communication with all stakeholders (schools, institutions of higher education, employers). The results of the given study coincide with the studies related to the change management conducted in other countries. For instance, as far as the study process is concerned, the present system of institutions of higher education has been found to be hindering the progress rather than facilitating communication, innovation, and creativity (Jongbloed, Enders, & Salerno, 2008). The studies carried out in Latvia show that internal obstacles to broader innovative changes are related to the cooperation between the students and the adminis-
In teacher education, the notion ‘innovation’ has a complex and multifaceted meaning. It refers to the process of renewal, educational reforms, the selection of the most appropriate teaching materials (idea, activity, form, method, means, concept, or program) and the creation, acquisition, and application of innovations in the pedagogical practice.

The results of this study give some insight in the innovative processes at one institution of higher education in Latvia from the point of view of students – pre-service teachers. The students have noticed the innovations in all the roles of the institution of higher education – the study process, research, and social engagement.

Besides, the students have shown their willingness to participate in the introduction of innovations and they evaluate the preservation of the traditional experience of the study process positively. The students believe that incremental innovations, i.e. the gradual harmonization of traditions and innovations, are appropriate in the study process. On the other hand, majority of the sample demonstrated the lack of self-initiative and gave preference to innovations initiated by some central authority (the administration of the institution). This view implies the need to have more extensive and multiform communication with the 1\textsuperscript{st} year students that would promote students’ participation in the implementation of innovations at the institution of higher education.

Innovations have been evaluated most positively in the context of teacher-student interaction – educators’ cooperation with students enhancing their interest in innovations. Students appreciate the role of the academic staff in the innovative processes recognizing them as their intellectual leaders. Professionalism is the most highly rated personal quality of the academic staff.

Following the results of the study, some recommendations can be proposed with regard to the sustainability of teacher education. One suggestion would be to promote an open dialogue between teachers, students, and the administration of the institution about the quality of studies and the operation of the whole institution. This would help
to identify barriers and facilitate the introduction of innovations at the given institution. Also, the students’ views identified in the study would be useful for the staff responsible for the adaptation of the first year students at the institution of higher education and those engaged in the activities of student self-government, thus expanding the range of agents involved in the creation of knowledge and solving complex practical problems.

References


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Civic participation, initiative and interest in current events can bridge the alienation felt towards national and municipal institutions, thereby enabling individuals to improve their quality of life and contribute to all-round sustainable development of their resident state. This paper reports on a participatory action research study into civic initiatives for securitability involving novice teachers and youngsters from the Latgale region of Latvia. Research participants evaluated national planning documents, enhanced their knowledge and devised civic initiatives to improve the quality of life. Focus group discussions and reasoned argumentative essays were employed to establish how novice teachers (n = 40) and youngsters (n = 58) make sense of the concept of ‘human securitability’. Data analysis was accomplished by qualitative content analysis. The action research exposed an initial understanding of novice teachers and youngsters regarding the human securitability and the possibilities of improving the quality of life. Moreover, this study provided an environment for the research participants to deepen their understanding of said phenomena and participate in educational events envisioning practical engagement with securitability and civic initiatives. The action research study created initiatives for the development of civic securitability and the participation in setting developmental goals.

Keywords: planning documents, human securitability, civic initiatives, novice teachers, youngsters

Every citizen is welcome to participate in the shaping of his/her country and select personally significant issues with a view to improve the quality of life for themselves and for others and to ensure sustainability in one’s own and others’ lives. Citizens of the world need to learn their way to sustainability since our current knowledge base does not provide solutions to contemporary global environmental, societal and economic problems. Today’s education is crucial to develop the ability of present and future leaders and citizens to create solutions and find new paths to a better future (UNESCO, 2015).

Education for sustainable development (ESD) promotes efforts to rethink educational programs and systems (both methods and contents) that currently support our
unsustainable societies and affects all components of education: legislation, policy, finance, curriculum, instruction, learning, assessment, etc.

Awareness of the importance of ESD inspired this action research study, which seeks to promote the participation of novice teachers and youngsters in planning our common futures with concern for themselves and initiatives designed to improve life in local communities.

The paper proposes an analysis of planning documents, discusses the concept of securitability, reports on the course of an action research study and highlights its key findings.

**Theoretical Background**

**National Planning Documents for Latvia’s Sustainable Future**

In Latvia, many national planning documents have an informative function. They outline prioritized areas of the country’s development. Hierarchically, the *Sustainable Development Strategy of Latvia until 2030* (Latvia 2030) is the country’s basic long-term planning document. Drafting of the strategy was under the aegis of the Cabinet of Ministers and was subsequently ratified by the parliament. Latvia 2030 (Saeima of Republic of Latvia, 2010) outlines the country’s long-term development priorities and lays down its spatial development perspective.

Other legally-binding planning documents include the *National Development Plan (NDP) 2014–2020* (Cross-Sectoral Coordination Centre, 2012), *Educational Development Framework 2014–2020* (Saeima of the Republic of Latvia, 2014), several conceptual reports, etc. These planning documents are fairly diverse in terms of content, which confounds their implementation. Regulations by the Cabinet of Ministers “On Public Participation Procedure in Development Planning” (2009) stipulate opportunities for public participation in the process of drafting national planning documents, but this option is unknown to many and tends to remain unused.

Although NDP for 2014–2020 was ratified in 2012, in December, 2014, the Cross-Sectoral Coordination Centre referred to new regulations by the Cabinet of Ministers (2014) “On Drafting Development Planning Documents and their Impact Assessment”. These regulations stipulate the creation of shared planning documents in related areas, reduce the number of guidelines from approximately 50 to 20 and emphasize cooperation of different departments to create coordinated development planning documents (Krůžkopa, 2014).

Thus, authors of planning documents acknowledge the need to reduce their overlap and fragmentation. The importance of public participation in the drafting of planning documents is acknowledged, but the argument refers to the general public, without singling out the most relevant and ready-to-be-involved target groups.

In view of the need to improve the quality of education, an action research study was envisioned to create opportunities to reflect on national planning documents and support civic initiatives among novice teachers and youngsters – the bedrock of future societies. Due to the critical role of youth in shaping the future, the present study involves novice teachers and youngsters in action research aimed at enriching and transforming their daily habits and understanding of their own securitability. This aim is compatible with action research design, because, in its social context, the latter is construed as democratic, equitable, emancipatory inquiry with the power to enrich the lives of individuals and communities (Stringer, 1996).
Youth Law (Saeima of the Republic of Latvia, 2008) in Latvia aims to improve the quality of life of young people. The mere existence of the rule of law, however, does not actually improve the quality of life of young people, if youngsters and novice teachers are not assisted in making sense of normative and planning documents.

An analysis of just a few normative documents exposes their importance in shaping the environment for planning the future. By helping youngsters and novice teachers make sense of normative documents, we provide them with opportunity to become involved in planning the future.

Securitability in Latvia’s National Planning Documents

National planning documents like the Latvian Sustainable Development Strategy for 2030 or NDP 2020 feature concepts that are rare in day-to-day discourse and vague in terms of their meaning. For instance, NDP 2020 has the meta-aim of “economic breakthrough” (see Figure 1). Although national economic development is, undoubtedly, important, its feasibility is debatable, because growth of new businesses requires active civic participation and secure governmental support to promote business initiatives.

The document specifies the meta-aim with three priorities: human securitability, growth of the national economy and growth for regions. Regrettably, it ignores the fundamental factors of sustainable development – development, not only in economics, but also in the cultural, social and environmental domains. Economic growth is not contextualized by integrating it with other aspects of sustainability.

![Figure 1. NDP 2020: Priorities and action areas (Cross-Sectoral Coordination Centre, 2012, p.15)](image-url)
In their model of the fundamentals of integral economics, Gerber and Steppacher (2014) argue that integral economics are inconceivable without components such as inner world, institutional structure and social metabolism. These concepts are rooted in sustainability, existential fulfillment, equity and democracy. Integral economics include integrated knowledge from different areas. Arguably, such a holistic perspective on economics should be a much more reasonable and effective platform for national development.

Often, national planning documents (guidelines and frameworks, plans and conceptual reports) formally endorse sustainable development, but feature unsustainable concepts. The above-mentioned “economic breakthrough” is an inherently unsustainable meta-aim for a national development plan, because it connotes conflict, a power struggle and survival of the fittest. The exclusive focus on “pure” economics to the detriment of social, cultural and environmental factors is unsustainable in the long term as a strategy of caring for the coming generations. Nations that seek to improve the lives of local communities require national planning documents with a holistic perspective on political, cultural, economic, environmental and social processes. Therefore, the making of planning documents should include discussions with the general public, especially with the young, who need to be made aware of the importance of their participation as early as possible.

An analysis of the above-discussed planning documents and involvement with teacher education and non-formal youth education spurred the need to explore the views of novice teachers and youngsters on national planning documents. In a sense, present-day youngsters are future policy-makers and novice teachers – strategic planners. These groups need informed understanding of the process of drafting normative documents and awareness of ways in which they can improve their quality of life.

Contextualizing the Concept of Human Securitability

Human securitability is a widely discussed concept, which resists reduction to the classical interpretation of freedom from fear and want. It is debated both in Latvia (Ozoliņa, 2012) and abroad (e.g., Eldering, 2010; Hastings, 2011; Lonergan, Gustavson, & Carter, 2009). The general view among scholars is that no universal definition of securitability can be agreed upon, which means that a fair degree of diversity is permissible in the way it is conceptualized and researched.

According to NDP 2020, human securitability as a form of resilience is a well-known concept in international circles, which denotes human adaptability to rapidly changing environments. Individuals with high securitability are confident, creative, able to take care of themselves and others and adapt to different circumstances (Cross-Sectoral Coordination Centre, n.d.)

In Latvia, concepts such as ‘human security’ and ‘securitability’ are discussed by the Latvian Platform for Development Society (LPDS) – an NGO that serves as an umbrella association for organizations presently or potentially involved with development cooperation and development education. Grounded on research, LPDS has created a Practical Guide to Improving Human Security at Community Level (Ozoliņa, Reinholde, & Rudzīte, 2014). Traditionally, the concept of securitability is applied to individuals in the face of threats that significantly impede satisfaction of their material needs, or to consequences of different conflicts. According to Ozoliņa (2012), the concept of securitability is especially relevant in situations that can be described as crises. In these
circumstances, human securitability has two aspects. The first is the crisis-stricken sector (economy, politics, security, social sphere). The second is an individual’s perception, knowledge and action potential to decrease prospective or actual consequences of the crisis.

In addition, Ozoliña (2014) suggests that securitability is affected by several factors: (1) knowledge; (2) motivation to participate in different processes; (3) responsibility for adopted strategies; (4) civic participation in social and governmental processes; (5) attitude to risk-taking.

As a rule, securitability tends to be associated with economics, food security, health, ecological security, personal security, community security and political security (United Nations Development Programme (UNDP), 1994).

Often securitability is contrasted to fear or insecurity. For instance, The Global Environmental Change and Human Security Project uses the Index of Human Insecurity, which is based on the inherent interrelationship between the environment and society and suggests that security is achieved if individuals are capable of terminating environmental, social and human rights-related threats or adapting to them (Lonergan, Gustavson, & Carter, 2009).

Eldering (2010) points to six general approaches (United Nations Development Report, UNDP; Generalized Poverty Index; Human Security Audit; Global Environmental Change and Human Security Project; Human Security Report Index; Human Security Mapping) to measure human security. Each of these approaches yields a different assessment. Eldering (2010) explains that security is a social construct whose definitions are geographically constrained to include different categories of threats.

David Hastings’ global Human Security Index compares human security across 232 countries (Hastings, 2011). The methodology features three axes – economic, environmental and social. These axes have several categories with a number of indicators each (34 indicators in total). The densest of all is the social axis, which includes the indicators regarding education, inequality, food security, agency, health and governance (Hastings, 2011).

The above analysis of different aspects of securitability confirms that the aim of the study is not to measure the objective dimensions of human securitability, but to use action research in order to promote subjective securitability and expand its understanding.

Subjective human security is construed as the perceived insecurity by residents in a specific geographical location, which involves their ability to adapt to or overcome actual or potential threats across seven dimensions of security – politics, economics, environment, health, food, communal security and personal security (Bambals, 2012).

**Involving Youth in Creating a Sustainable Future**

Admittedly, sustainable development is not a technical issue of preserving natural values; it is primarily a political and cultural issue, which involves responsibility on practical and institutional levels (Scerri, 2012). Building awareness of sustainability requires individual participation and agency, which can be supported through action research.

According to Cammarota and Fine (2008), participatory action research enables youngsters to become major change agents and revolutionaries in the field of education. Age 16 to 21 is the time for personal and professional self-determination. At this age
youngsters choose their perspective in life and create their identity – choose a social orientation, develop a worldview, seek meaning in life. Age 22 to 30 is the time for building families and developing competences (Kalva, 2007). All of the above makes this a crucial time for educational youth work. Schools, universities and NGOs have a shared challenge – attracting youngsters to local community by analyzing local and global problems and therefore helping them make sense of different social, political and economic processes, as well as relevant normative documents. Since youngsters are the bedrock of the next generation, joint planning and evaluation of political documents and processes help clarify a shared vision for a future where each youngster is responsible for his or her actions and capable of changing global or local processes. Pitting generations against each other is to be avoided at all costs; the way forward is cooperation (Robertson, 2007) and civic agency as well as concern for our shared sustainable future.

Concern for a better future rests on civic initiatives – community endeavors that bring together different institutions, governmental and non-governmental organizations, and individuals in pursuit of a better day-to-day existence. Civic initiative is construed as

a process of a participatory democracy that empowers the people to propose legislation and to enact or reject the laws at the polls independent of the lawmaking power of the governing body. The purpose of an initiative, which is a type of election commenced and carried out by the people, is to permit the electorate to resolve questions where their elected representatives fail to do so or refuse to proceed with a change that the public desires (Citizen Initiative, n.d.).

When planning civic initiatives, novice teachers must bear in mind their essential aspects:

- reinforcing opportunities and strengthening public capacity to participate in social processes, as well as building awareness of the role of individuals in shaping their community, region and state;
- increasing participation among socially inactive segments of population;
- promoting cooperation between stakeholders and national and municipal institutions as well as the private sector;
- creating an innovative approach to promote civic participation.

For novice teachers, leading or supporting the civic initiatives at school can be challenging, but they are the surest way to raise awareness of the opportunities of democracy and of the teachers’ role, both in school and beyond (Healy, Dobson, Kyser, Herczog, & Genzer, 2014).

The United Nations Environment Programme “Environment for Development” and Agenda 21 underscore the crucial role of children in fostering sustainable development (United Nations Environment Programme Environment for Development, n.d.). Some big NGOs set fine examples of youth agency to bring sustainability into the daily lives of youngsters. For instance, The Youth for Sustainable Development Foundation (YSDF) (n.d.) has a dual mission to educate young people (5–35 years) on current environmental issues and futures and conduct sustainable projects in developing countries.

In Latvia, Youth Law (Saeima of the Republic of Latvia, 2008) aims to improve the quality of life of young people (that is, persons from 13 to 25 years of age) by fostering youth initiative, agency and patriotism, participation in decision-making processes and
involvement in social life, as well as supporting youth work. Thus, civic initiatives can be implemented only by youngsters concerned with the future and community wellbeing, notably, the quality of life on personal and societal levels.

Youngsters are malleable and open to life’s many challenges. Their practical participation and initiative create experiences that foster securitability and flexibility. The latter is also an important attribute for teachers – it helps in teaching, management and learning life skills (Day & Gu, 2014). Flexibility is improved through learning together (Gu & Day, 2013).

The present study involves youngsters and novice teachers and seeks to discover how joint learning and participation in action research can deepen participants’ understanding of securitability and promote initiatives to improve quality of life.

Design and Methods

This chapter will start with a brief description of approach to action research used in the study, continue with essential information about research participants and conclude with discussion of findings from key action research stages.

In Latvia, action research is an emergent approach to inquiry in educational settings. For the purpose of the present study, it is important to refer to action research implemented in the contexts of teacher education and sustainability. These include studies by Salite regarding the pre-service teachers’ perception of the aim of education for a sustainable future (Salite, 2008; Salite, Gedžūne, & Gedžūne, 2009) and pre-service teachers’ research skills (Salite, Mičule, Kravale, Iliško, & Stakle, 2007). Others have used action research to explore and promote ecological consciousness in the setting of teacher education (Gedžūne & Gedžūne, 2011) and initiate discourse on inclusion in an e-learning environment in teacher education (Gedžūne & Gedžūne, 2013).

Action research is also a way of creating new knowledge (Dick, 2009; Kapenieks & Salite, 2012). The present study uses participatory action research, viewed as a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview....[and bringing] together action and reflection, theory and practice, in participation with others in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and communities (Reason & Bradbury, 2001). According to Bostock and Freeman (2003), participatory action research is especially suited to youth work, since it raises youngsters’ awareness of the types of support available to them and enables them to discuss individual participation.

The aim of the present action research study was to enrich novice teachers/youngsters’ understanding of planning documents, securitability, and civic initiatives as well as to build initiatives to improve the quality of life. The study began with four research questions:

1) Are novice teachers/youngsters aware of national planning documents?
2) How do novice teachers/youngsters make sense of planning documents and the concept of securitability?
3) How can the novice teacher and youngsters’ understanding of the planning documents be enhanced?
4) How can initiatives to improve the quality of life and securitability of individuals and communities be supported?
The present study relies on an approach to action research and data analysis discussed by Pipere (2011a, pp. 220–242; 2011b, pp.188–198). The action research was conducted in three stages, featuring a series of steps. Due to spatial limitations, the paper will only focus on key steps and highlight essential findings. Thus, the paper will outline two stages of action research – university teachers and researchers’ work with novice teachers, and novice teachers’ engagement with youngsters. Discussion of the findings will focus on civic initiatives proposed by youngsters and novice teachers. The aim of the 3rd stage of action research was to support the participation of young people in civic initiatives to improve quality of life.

Researcher Process and Participants

The study was conducted over the course of the academic year 2014/2015 and involved a cohort of 40 students who were enrolled in a professional Master’s programme in Education at the Daugavpils University. The course “Securitability and Occupational Safety in Education” became the environment for the present study. Course implementation involved such forms of teacher-learner and learner-learner interaction as lectures, seminars and focus groups. Stage 1 of the study involved 28 females and 12 males, with representatives from all four regions of Latvia. The majority of the students (85%) had some pedagogical experience.

In addition, the action research study involved a number of youngsters. Stage 2 of the study was conducted over the course of the second semester of 2014/2015 (from January to April). It involved youngsters from three municipalities of Latvia (Daugavpils, Rēzekne, Dagda) – small, medium and large municipalities, respectively, with populations of up to 10 thousand, 30 thousand and 90 thousand. In all, 58 youngsters, all voluntary recruits in the study, joined the inquiry and improved their knowledge; of these recruits, 42 participants were females and 16 were males, although gender differences will not play a part in the subsequent data analysis. The youngsters’ age ranged from 14 to 23. All of them were students in general or vocational education schools.

Stage 1 of the study was conducted in three consecutive steps:

**Step 1** consisted of a focus-group interview to appraise novice teachers’ common notion of normative planning documents. A focus group interview was used to elicit research participants’ views on planning documents and identify the meaning attributed to them. The focus group was conducted and analyzed by academic and research staff from Daugavpils University.

**Step 2** included the appraisal of the novice teachers’ understanding of planning documents (NDP 2020) and the concept of ‘securitability’ through lectures and seminars (on national planning documents; educational security; food and health; social security and civic initiatives) as well as focus-group interviews and argumentative essays. The focus-group interview was conducted by academic and research staff from Daugavpils University who also transcribed the interview and analyzed the transcript. The present paper will outline findings only from argumentative essays. Novice teachers were invited to write an argumentative essay “Evaluation of My Living Space” and answer the following questions: How safe do you feel in the environment you study/live/work in? What factors affect your safety? What is the cause of your greatest insecurity? How could it be removed? In your opinion, what are the sources
of securitability? How can securitability be defined? No restrictions were placed on student essays regarding their length and contents. Argumentative essays were subjected to thematic analysis, performed by drawing on the insights of Howitt (Howitt & Cramer, 2008) – looking for themes and subthemes. Thematic analysis of argumentative essays yielded the following themes discussed by research participants as the pillars of securitability: 1) personal convictions; 2) flexibility; 3) financial security; 4) environment-building. The paper contains a more detailed analysis of these patterns, buttressing the argument made for each pillar with relevant quotes from student essays.

**Step 3** included data analysis and civic initiatives. The data obtained during the action research from the novice teachers were analyzed by researchers using thematic analysis. The goal of the activities related to civic initiatives was to summarize diverse definitions of securitability, evaluate their contents and plan initiatives to foster securitability and civic participation in setting developmental goals. Novice teachers were asked to create the plan of their initiatives in a free form (to be submitted in paper) and to implement the initiatives, afterwards submitting their description in a paper form or as video clips.

**Novice Teachers’ Understanding of Normative Planning Documents**

The data from the Stage 1 obtained through the focus-group interviews suggest that novice teachers have little awareness of national and international planning documents. Novice teachers admit to perusing such documents infrequently and casually due to their perceived irrelevance to novice teachers’ day-to-day work. Research participants fail to relate normative documents to their personal lives, because their drafting and implementation is considered a political initiative, which novice teachers are unmotivated to join. The majority (80%) of novice teachers involved in the study report no prior knowledge of NDP 2020, while 20% claim they had heard of it before but deny having a clear idea of its contents.

The findings suggest that novice teachers have little to no interest in national planning documents; the study also exposes a wide gap between authors of said planning documents and the realities of life. During focus-group interviews, novice teachers mentioned several examples of their disillusionment in policy-makers, which accounts for their failure to perceive the need to participate in national planning. Some participants were unaware of the existence of many national planning documents and failed to perceive the need to know and implement them in day-to-day practice. The further discussion was structured around NDP 2020 – participants were invited to evaluate its priorities and directions. Next, the novice teachers cooperated with their university teacher to develop topics for seminars and lectures, which were targeted at helping novice teachers make better sense of planning documents and the concept of securitability.

**Novice Teachers’ Understanding of Securitability**

Since planning documents prioritize securitability, the present action research study focused on research participants’ understanding of this concept and sought to analyze diversity of meanings attributed to it. These findings informed the decision to help novice teachers improve their understanding of ‘securitability’ as a concept. The discussion
exposed vagueness of the concept of ‘human securitability’ – research participants regarded it as difficult to understand. This resonates with the argument by Ozoliņa (2014) about knowledge as one of the many aspects of human securitability.

The deeper understanding of securitability was elicited from novice teachers’ argumentative essays. The essays exposed a subjective understanding of human securitability – novice teachers’ personal perception of security. Although the present paper thinned out seven dimensions of securitability (politics, economics, environment, health, food, communal security and personal security), novice teachers’ argumentative essays featured merely four factors of securitability: 1) personal convictions; 2) flexibility; 3) financial security; and 4) environment-building. It is evident that these factors only partially overlap with the theoretically proposed dimensions of securitability. Following paragraphs will outline key insights gleaned from novice teachers’ writings. Direct quotes will be used to support the line of argument.

Analysis of the essays exposed personal convictions and capacities as a key factor of securitability. Also, securitability is believed to rest on informed and rational decisions, personal contribution to one’s safety and fine communication skills. Faith is an important contributor to securitability. To quote from an essay: “I feel secure that my employer understands me; as to the rest, I try not to worry and trust in Providence. I also try to act wisely, reasonably and calmly so as not to provoke people who might threaten me.”

Another important factor of securitability to emerge from the study is flexibility. “Securitability is willingness and readiness to change along with changing circumstances and situations; successful adaptation to new situations and circumstances.” Also, “I am flexible and adaptable, I do well in new situations and accept them as normal occurrences rather than insurmountable challenges.” In some essays flexibility is discussed not as an aptitude, but as a consciously cultivated trait: “Adapting to given circumstances, awareness of one’s role in society, transforming failure into a springboard for further action and making use of all available potential to move forward.” “My teachers’ securitability depends on me. [It depends] on the teacher or educator’s personal characteristics, on [his or her] depth and breadth of understanding, which is used to navigate pedagogical challenges. [It implies] maintaining a sense of security; ability to regain it, if lost, without fear of others.”

The third factor of securitability deduced from novice teachers’ essays is financial security. Novice teachers consider financial resources an important contributor to securitability: “I hope for sufficient funds, financially accessible medical care of adequate quality and no holes in the family budget.”

Finally, novice teachers relate securitability to creating safe environments, with individuals contributing to their formation: “Safety in numbers (belonging to a group); safety regarding one’s wages; safety regarding one’s health; safety in development, improvement and growth.” Others explain security through the prism of insecurity: “People inhabiting the Earth are like fish in a tank – if someone starts siphoning off the water, you jump into another full tank, not waiting for the last precious drops to disappear.”

The data suggest that novice teachers appreciate opportunities to engage in co-evaluation of planning documents in terms of their relevance to their day-to-day professional lives. The concept of securitability, although defined in planning documents, has made sense of through the prism of subjective experience. Research participants acknowledge the need for active involvement in the study process and admit that joint evaluation
and analysis of relevant concepts improves their understanding of social processes. Data from thematic analysis indicate that novice teachers’ securitability is related to personal factors, flexibility, employee-employer relationship, financial affairs and safe physical environment.

**Civic Initiatives Proposed by Novice Teachers**

In Step 3, in keeping with the spirit of action research, novice teachers were given full responsibility for planning civic initiatives for their community, region or country. Action research was integrated in the study process, so the teaching staff was on hand to give advice and offer ongoing support. As pointed out by Brezicha, Bergmark and Mitra (2015), providing teachers with differentiated support improves teachers’ understanding of the reform and supplies teachers with necessary tools to implement the new idea, facilitates teacher voice and participation in the process. In total, 40 novice teachers proposed 43 educational initiatives to boost youngsters and teachers’ interest in planning documents, securitability and improving quality of life. Researchers categorized these initiatives in three thematic groups:

1) by-laws of educational institutions;
2) educational security: trust and violence;
3) ambition, initiative and participation.

Novice teachers planned initiatives to increase agency among themselves and others. Thus, in the first thematic group novice teachers intended to bring together youngsters, teachers and school principals as co-creators of school by-laws. This initiative sought to avoid formalism and ensure that the by-laws are worded in a comprehensible manner, which should increase the likelihood of their implementation in the day-to-day practice of the given school.

The second thematic group suggests that teachers would plan meetings with professionals who are responsible for human safety and anti-violence initiatives. Also, they would summarize life stories that illuminate the importance of teamwork in times of crises, teach how to cope with violence and highlight the essential role of trust in an educational setting.

The third thematic group features initiatives to diminish indifference among youngsters and boost their willingness to participate in social processes. Key to these initiatives is the teacher’s personality in that the teacher ceases to be a mere instructor and becomes a motivational leader who awakens and inspires youngsters to plan and achieve new goals. These initiatives suggest that teachers’ initiatives are intended for their communities, as they have a better understanding of local needs and environmental problems.

Novice teachers backed prospective initiatives with detailed plans for the future or gave presentations of already completed initiatives. No restrictions were imposed on the form and contents of these plans and presentations.

**Youngsters’ Civic Initiatives: Creation of Video Clips**

The second stage of an action research describes the civic initiatives carried out by youth. Although, there exist the manifold forms of civil initiatives, however, young people, together with the researchers, decided to create video clips to better address their peers in the community.
As suggested above, upon completing their participation in a study at the Daugavpils University, novice teachers were invited to work with youth according to a similar plan and answer the questions originally set for the first stage of the action research study: 1) explore the contents of planning documents, 2) build understanding of planning documents and attempt to make sense of the concept of securitability, 3) improve understanding of planning documents, and 4) promote civic initiatives to improve quality of life. Work with youth was undertaken by academic and research staff of Daugavpils University in cooperation with novice teachers, but only eight teachers consented to their work being analyzed in the present paper. Novice teachers worked at the school both as the class teachers and persons responsible for out-of-school work. Therefore, this stage of action research was oriented toward out-of-school educational environment for youngsters who would like to improve their knowledge and to be engaged in practical activities of civil initiatives via creating video clips in order to improve their own and peers’ quality of life.

Altogether, 58 youngsters volunteered to participate and created short video clips about securitability in their communities. These youngsters were students in educational institutions where the novice teachers were employed. Video clips were analyzed implementing the method of thematic analysis of qualitative data.

Analysis of these clips suggests that observation of different situations and analyzing other people’s behaviors, thoughts and feelings gave research participants new ideas to be implemented in their local communities. Youngsters created their video clips in groups of 5 to 8; it was a way of inviting youngsters to reflect on opportunities to improve their own and others’ quality of life. Admittedly, youngsters’ civic initiatives were inspired by personal concerns and responded to local needs. Youngsters chose topics for their video clips with a view to best addressing their peers. The video clips highlighted issues such as healthy lifestyle, community involvement, support to socially excluded individuals and groups, etc. Despite the multiple challenges accompanying the creation of video clips, youngsters found the ambitious task interesting and stepped up admirably to the challenge of improving quality of life with minimum resources as well as showing others the way forward. Youngsters gave snappy titles to their video clips, which illustrate their commitment. They also annotated their video clips. All in all, their work suggests pride in their achievement and ability to find inspiration for the future in the day-to-day realities of life.

The video clips focused on change (“Grandpa, today I took a step towards who I want to become”); emphasized opportunities to make others happy (“Only YOU can change the life of someone less fortunate. Our lives are what we make of them. We enjoy living a world populated by kind, smiling people; in a world where everyone seeks safety. To change something, we need to act, because ultimately you get what you give, so it is important to do good, if you want others to treat you well”); and advocated participation (“I say “Yes” to opportunities and dreams”).

Thus, comparison of novice teachers and youngsters’ civic initiatives suggests that they differ in terms of form. Although youngsters were free to choose the way of presenting their initiatives, most opted for interactivity and made use of technological advances. Youngsters admitted to being positively excited by the process, which involved participating, creating, constructing and evaluating different documents, events and realities of life.
The study suggests that action research enables its participants to create and construct new knowledge and seek ways to achieve their goals.

Novice teachers evaluated their experience of involvement in action research along the following lines: "What matters is work and progress. A spade is a universal agricultural implement that reduces stress, allows for physical activity, helps clear the mind and keep fit, gives immediate and obvious results, and improves material wellbeing with the fruits of one’s labor. One just needs to keep digging. I don’t pine for what I can’t have but rejoice in what I do possess." With this extended metaphor, the research participant points to an important feature of action research – responsible participation in inquiry.

Thus, research participants acknowledge that action research is an excellent approach to self-inquiry – appraising one’s opportunities and creating new personally relevant knowledge. In addition, they recognize that participation and cooperation are important success factors for reaching action research goals.

Also, the study suggests that action research is a valuable challenge to novice teachers, because communication with youngsters helps them evaluate their own communicative skills and ability to relate concepts from formal planning documents to everyday life.

**Discussion and Conclusions**

The present action research study was fraught with multiple challenges inherent for this type of inquiry. Series of steps were taken to answer relevant questions. The findings suggest that novice teachers/youngsters are poorly informed of national planning documents. Creation of planning documents and participation in this process are insufficiently understood. Too often, creation of such documents is related to political change and intrigue.

Joint examination of planning documents and their priorities exposes a narrow understanding of securitability, which is grounded in personal experience. However, active involvement in the study helped research participants to uncover new aspects of securitability. Youngsters and teachers admit that joint practical engagement with securitability deepens their understanding of relevant processes, events and facts, illuminates previously hidden aspects of day-to-day existence and contextualizes securitability.

The present action research study concluded with civic initiatives that responded to local needs and were tailored to local communities. Action research emerged as a time-consuming yet worthwhile endeavor that involves raising awareness of local and global processes and highlights the importance of support to efforts which seek to improve quality of life.

Although civic initiative and interest are keys to continued existence of states, formalistic top-bottom regulations do not welcome public participation. Education is the path towards individual quality of life and emergence of knowledge society as well as economic growth and wellbeing of nations. The *Latvian Educational Development Framework for 2014–2020* (Saeima of the Republic of Latvia, 2014) stipulates that investment in education and lifelong education is fundamental precondition for national economic development, increased competitiveness, higher standard of living and wellbeing. Nevertheless, day-to-day educational practice is fraught with various problems, which suggests that education as a process should be much more active and meaningful.
The present paper focuses on one priority in national planning documents – human securitability. An action research study exposed multiple nuances in novice teachers and youngsters’ perception of planning documents as well as their views on the viability of these documents in the day-to-day practice. The study suggests that novice teachers and youngsters tend to feel alienated from the state because they fail to comprehend the process of drafting national planning documents and see no opportunities to participate in strategic planning. Youngsters are often regarded as the revolutionaries of education (Cammarota & Fine, 2008), but they need teachers capable of acting as leaders – help youngsters make sense of their opportunities and assist them in developing new initiatives to improve quality of life.

The present action research study enabled its participants to achieve valuable learning outcomes due to the fact that each and every student was involved in setting learning goals. The initiatives proposed by novice teachers and youngsters are the first step towards welcome change in their lives. Action research made it necessary for youngsters and novice teachers to develop life skills, because finding themselves in new situations required making strategies to deal with relevant challenges. Civic initiatives and human securitability contribute to the betterment of daily life as well as support the belief that every individual is invited to contemplate their own and others’ future, and take active part in global processes.

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Values and Values Education in Estonian Preschool Child Care Institutions

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Abstract

The objective of the study was to provide an outline of the values that principals, teachers and parents of preschool child care institutions consider important to be taught to children, and which activities, in their estimation, should be used to implement values education in child care institutions. A total of 978 respondents from all 15 Estonian counties returned the quantitative questionnaire, including 163 principals, 425 teachers, and 390 parents of preschool child care institutions. The statistical data analysis was applied to process the quantitative data obtained. The values that are more important to be taught to children, according to principals, include sense of humour as well as pride and inventiveness, whereas teachers value patience as a significantly more important value to be taught. Compared to principals, parents consider confidence and commitment more important, while, compared to teachers, parents consider it more important that kindergartens teach the importance of a good education. Values education in child care institutions takes place primarily in adherence to the relevant group’s rules in the course of everyday communication and activities. Personal role models are considered to be very important in values education.

Keywords: values, values education, preschool child care, preschool teachers, parents, preschool principals

The UNESCO Roadmap for Implementing the Global Action Programme on Education for Sustainable Development has highlighted that “Educators and trainers are powerful agents of change for delivering the educational response to sustainable development. But for them to help usher in the transition to a sustainable society, they must first acquire the necessary knowledge, skills, attitudes and values” (UNESCO, 2014, p. 20). It is also stressed that “Education for Sustainable Development (ESD) encompasses formal, non-formal and informal education and lifelong learning from early childhood to old age” (UNESCO, 2014, p. 33). The UN Decade of Education for Sustainable Development (2005–2014) Final Report states that “ESD starts with early childhood care and education (ECCE). Reorienting ECCE towards ESD must begin from birth, and not only through pre-primary school settings, but also in the home and wider community” (Buckler & Creech, 2014, p. 10). Therefore, it is vital to start shaping values
and attitudes in early childhood. The importance of values and values education is also underlined in an OECD (2012) report that highlights the fact that a national curriculum or similar must deal with the primary objectives of preschool education and child care, and include applied concepts and values.

Values education is also a core aspect of the programme Values Development in Estonian Society 2009–2013. Next to moral education, the central scope of values education is to provide support to a child’s development in a manner that would allow the child to develop into an active citizen, and a creative, analytical and enterprising individual. The program supports the notion of a shift in knowledge-based educational institutions to become more values-based educational institutions (Ministry of Education and Research, 2009). Since childhood is when our values largely develop, the role of preschool child care institutions outside the home in teaching children and developing their values is crucial (Sutrop, 2010). Therefore, it is important to pay more attention to values and values education in preschool child care institutions.

Values and values education in organizing and implementing the provision of education and child care in preschool education is highlighted in the Estonian National Curriculum for Preschool Child Care Institutions (Government of the Republic, 2008) and its handbook (Kulderknup, 2009). Unfortunately, neither the Estonian curriculum nor its handbooks include a separate chapter for values education. There is also no indication about what values children should certainly be taught in a preschool children’s institution. The goals of values and values education are mentioned under general skills and among the goals of different areas of teaching and education as well as among learning skills.

From the perspective of values education it is required that teachers take notice of their own personal values and perceive their role as values transmitters. The national program Values Development in Estonian Society 2009–2013 points out that teachers with their behaviour serve as role models for children as well as actuators of values-related discussions and reflections. The role of principals of educational institutions is pivotal as they are largely accountable for how much importance is placed on culture-related and values education in a child care institution as an organization. Since parents are also central to values education, values education in child care institutions must be implemented in collaboration with parents (Ministry of Education and Research, 2009).

Values

Values have been studied extensively over the past decades. Among the most well-known values researchers and definers are Rokeach, Schwartz and Inglehart. According to Rokeach (1973), values are an inherent aspect of culture and the collective perception of a desired state. Rokeach defines values as follows: “A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence” (1973, p. 5). Schwartz sees values as connected to desired goals, which prompt human behaviour. Negotiating core values underlies how attitudes and behaviours are formed, and values are seen as the basis for making decisions about actions, people or events, and what is good or bad, warranted or purely random, what is worth pursuing and what is worth avoiding, given certain options (Schwartz, 1992, 2012; Schwartz et al., 2012). Schwartz
(1992) has created the theory of basic values and finds that basic values are acknowledged by all people in the world. Values differ in terms of the ultimate aims and targets they entail, or are targeted to achieve. Inglehart maintains: “A culture is a system of attitudes, values, and knowledge that is widely shared within a society and is transmitted from generation to generation” (1997, p. 15). Inglehart is the leader of the World Values Survey (WVS) and points out that “these surveys show pervasive changes in what people want out of life and what they believe. These surveys provide valuable information about a crucial component of social change: the values, beliefs and motivations of ordinary citizens” (Values Change the World, 2012).

According to the mentioned authors, values drive people’s behaviour and attitudes, and so it is important to understand values as a universal notion and how values are understood by different people. In the context of teaching values, the design of the learning environment in preschool institutions is important, as are what adults believe the content of such education should be and what they consider should have priority. Similarly, the attitudes and values transmitted by the behaviour of teachers and parents are also important.

Values are always abstractions, functioning as the criteria in the choices made by individuals and groups of individuals (Hirsjärvi & Huttunen, 1998). Individual value preferences determine to a certain degree how the surrounding environment and different situations are perceived (Kera, 2004). Values are not manifest in their pure form, as one thing or one characteristic in all domains of human activity but, rather, latently as an agglomeration of a number of patterns. A part in recognizing right and wrong is played by cultural consensus, whether such judgments are socially shared and their significance acknowledged (Tart, Sömer, & Lilleoja, 2012).

**Values Education**

Education has been seen as a domain where intensive efforts are put into values intermediation as well as into cultures that establish new values. The socialization of young children has also been identified as part of the role of public education. The term ‘socialization’ refers not only to the intermediation of knowledge and skills but also to the most important values and norms in society. Educational goals, whether abstract or defined, always attest to certain values (Hirsjärvi & Huttunen, 1998).

When children are born, they are immediately surrounded by values that serve as a guide in a particular culture and society. In various socialization processes, children develop a moral and ethical basis that is built through what is heard, experienced, and reflected by society (Veisson & Kuurme, 2010). Barni and colleagues (Barni, Knafo, Ben-Arieh, & Haj-Yahia, 2014) stress the importance of the surrounding culture in acquiring values. A child develops socially in his/her activity and behaviour wherein relevant objects are appraised. The appraisal is connected to human consciousness and feelings (Kera, 2004). Values do not emerge automatically; they are taught and learned from the moment a child is born (Long Bostrom, 1999). Values that are today passed on to children become most significant as seen from the perspective of future societies. All adults teach children values, whether consciously or subconsciously, making it essential that the process of values education be acknowledged and thought through (Schiller & Bryant, 2009).
Values and Values Education in Estonian Preschool Child Care Institutions

Values education may be said to include everything that affects children’s value judgments and attitudes. Values education is manifest in practically everything: for instance, next to school classes also in rules, events, social relationships, traditions, and the entire environment surrounding children (Schihalejev & Jung, 2012). Initially, small children learn by following orders and prohibitions as well as by imitating role models. As children grow, awareness of their own values, and discussion of their own values, as well those of others, becomes more and more important (Sutrop, 2009). Johansson and colleagues (2014) have studied values in the routine lives of day care centres, and stress the importance of discussing values and rules together with children. The paramount task of a teacher as the guide in values education is to establish an environment suitable for a child’s development (Neeme, 2011). The relevance of environment is also emphasised by Sutrop, Harro-Loit and Jung (2013). They consider it important that children are able to operate in accordance with positive values. Veisson and Kuurme (2010) claim that if one desires to develop values through learning activities, such learning activities must be made as experience-rich as possible; in other words, situations must be established that help convince children of the goodness of certain values, and at the same time, teach children to place value in other people as well as themselves.

The objective of values education is to promote the shaping of values that are the foundation of an inter-functional coexistence of a happy personal life and society; when teaching values, every activity that helps children gather the necessary experience and abilities to utilise and embrace values as a code for functioning as individuals and members of society is of importance. Next to the provision of knowledge in values education, shaping characteristic features is also important, and it is necessary to support the shaping of children into active citizens, and creative, analytical and enterprising people that are not only aware of values but also customarily live by such values (Sutrop et al., 2013). Pedagogical circles are becoming increasingly convinced that values education should be carried out on the basis of a hidden curriculum. This means that values education should be transferred through all the learning and educational activities of an educational institution (Krull, 2000). The Estonian preschool child care institutions are aiming to make values education central to the preschool child care institutions’ curriculum and to include values in all learning and educational activities.

In Estonia, Veisson (2009) has explored the opinions held by core stakeholders in general education schools in relation to values. Furthermore, Tulviste and Kikas (2010) examined the views of mothers, fathers and primary school teachers in relation to qualities to be developed at home and at school in Estonia. Moreover, Tulviste (2013) has comparatively studied the opinions of the mothers and fathers of students about what are the most important qualities for children to develop. The Estonian Human Development report provides an overview of values research from the last twenty years that compares Estonia with other countries. The aforementioned studies have asked parents, what values they consider important to nurture in their children. Parents want children to learn determination, stamina, obedience and independence; only a few considered religiosity important (Realo, 2013).

The authors of the current article are not familiar with any comprehensive studies conducted about what values preschool child care institution principals, teachers and parents consider important to be taught and what methods are used in values education.
Objective of the Study and Research Questions

The objective of the study is to provide an insight into what values are considered important to be taught to children in Estonian preschool child care institutions and what activities are currently used for values education. Proceeding from the objective of the study, the authors posed the following research questions:

- Which values do principals, teachers and parents consider important to be taught to children in preschool child care institutions?
- Through which activities is values education implemented in preschool child care institutions according to principals, teachers and parents?

Research Methodology

Method

The data for this research was collected via a questionnaire, which consisted of two parts. Part A included the Estonian version of Schwartz’s Portrait Values Questionnaire (Schwartz et al., 2012), which helped to find out the personal values of principals, teachers, and parents from Estonian preschool child care institutions (Ülavere & Veisson, 2015). Part B included a semi-structured questionnaire about the activities of values education in preschool child care institutions. The current study provides an overview of the answers to the following questions in Part B: Which values do you consider important to be taught to children? Through which activities is values education implemented in the preschool child care institution?

As a basis for the list of values used in part B of the questionnaire, the authors selected 20 values suggested to be taught to preschool children by Schiller and Bryant (2009). Their book about values was chosen because it has been used as methodological material in Estonian preschools. Although the title of the book mentions 16 basic values that should be taught to small children, some of the values have been introduced together (e.g., persistence and dedication are mentioned in one chapter). Therefore, the questionnaire presented these two as separate values. Taking this into account, the authors included altogether 20 values in the questionnaire based on the book by Schiller and Bryant. To the aforementioned 20 values, the researchers added in turn respect for traditions, health, trust, wisdom and good education. Respect for traditions, health and trust are considered important in the Estonian National Curriculum for Preschool Child Care Institutions (Government of the Republic, 2008) and its handbook Areas of Learning and Educational Activities (Kulderknup, 2009). In the study by Veisson (2009), parents considered academic success most important, and, therefore, the authors also added wisdom and good education to the list. The list of activities used for values education in preschool child care institutions was compiled by taking into account the areas of learning and educational activities of the National Curriculum for Preschool Child Care Institutions (Government of the Republic, 2008), as well as activities brought out in the curriculum handbook (Kulderknup, 2009).

The question Which values do you consider important to be taught to children? included a list of 25 values (Kulderknup, 2009; Government of the Republic, 2008; Schiller & Bryant, 2009; Veisson, 2009, see Table 1). To each value the respondents had to give an answer on a 6-point Likert-type scale as follows: 1 – not at all important,
2 – not important, 3 – rather not important, 4 – rather important, 5 – important, 6 – very important. If they chose to do so, respondents could specify, which values in addition to the ones listed they consider important to be taught to preschool children.

For the question *Through which activities is values education implemented in the preschool child care institution?* the authors had presented 25 activities through which values education could take place in preschools (Kulderknup, 2009; Government of the Republic, 2008; see Table 2). The answers were measured on a 6-point Likert-type scale as follows: 1 – do not agree at all, 2 – do not agree, 3 – rather do not agree, 4 – rather agree, 5 – agree, 6 – fully agree. Furthermore, respondents could add their own activities to those listed in the questionnaire. All respondents, principals, teachers and parents of preschool child care institutions received the same questionnaire.

**Sample, Data Collection and Processing**

The questionnaire-based study was conducted in March-April 2013. The questionnaire was forwarded to 1,210 respondents (184 principals, 517 teachers, and 509 parents) at preschool child care institutions. Participation in the study was voluntary. A total of 978 respondents from 15 counties across Estonia returned the questionnaire, including 163 principals of preschool child care institutions, 425 teachers – 5% of preschool child care institution teachers in Estonia as of 2012 (Estonian Ministry of Education and Research, 2012) and 390 parents. Since almost all teachers and principals at Estonian preschool child care institutions are female, as were most respondents among parents (only 34 respondents were men), no comparative analyses were made between genders. Therefore, one can say that the current sample features predominantly the views and evaluations of women.

In compiling the sample, the authors wanted to ensure that all of the counties in Estonia would be represented, and that 5% of preschool child care institution teachers from each county would be included in the sample. The sample included both rural and urban institutions; selection was based on the collaboration of subjects, and the principle of easy access. Questionnaires were completed anonymously, the gained data was analysed and the results presented in a generalized manner.

In the process of data collection, the authors received help from volunteer assistants in all 15 counties of Estonia. They helped to distribute and collect the questionnaires in preschool child care institutions. When necessary the authors called the principals and explained the goals of the study. An introduction to the study, as well as the contact details of the researchers were also written on the first page of the questionnaire. The questionnaires were sent to preschool child care institutions on paper. In order to ensure anonymity, the respondents returned the questionnaires in a sealed envelope. All preschools received the questionnaires for principals, teachers and parents simultaneously.

The following SPSS 14.0 procedures were used in data processing: Frequencies, Descriptives, One-Way ANOVA, Post Hoc tests and Reliability Analysis. MS Excel was employed in preparing tables, verifying and compiling data.
Results

Values Considered Important to be Taught in Preschool Child Care Institutions

Principals, teachers and parents of preschool child care institutions consider the following values as most important to be taught to children (see Table 1): honesty (average assessment across three groups \( M = 5.83, SD = 0.41 \)), health \( (M = 5.73, SD = 0.51) \), helpfulness \( (M = 5.71, SD = 0.51) \), cooperation ability \( (M = 5.66, SD = 0.55) \), tolerance \( (M = 5.60, SD = 0.58) \), trust \( (M = 5.59, SD = 0.59) \), sense of duty \( (M = 5.59, SD = 0.59) \), and independence \( (M = 5.57, SD = 0.59) \). Principals, teachers and parents of preschool child care institutions consider the following values as less important to be taught to children: pride \( (M = 4.03, SD = 1.12) \), principled behaviour \( (M = 4.90, SD = 0.87) \), and loyalty \( (M = 5.14, SD = 0.80) \). The respondents added caring, creativity and responsibility to the list of values as very important to be taught to children.

An ANOVA test (see Table 1) indicates that principals, teachers and parents of preschool child care institutions provided a similar evaluation of the following 15 values: honesty, trust, sense of duty, independence, respect, sense of justice, good education, persistence, wisdom, sympathy, courage, patience, loyalty, principled behaviour, and pride.

Principals and teachers of preschool child care institutions provided very similar evaluation of values taught to children in kindergartens. In evaluations provided by the two groups, a post-hoc analysis revealed differences only in the case of four values. Principals consider it more important that children are taught a sense of humour, pride and inventiveness \( (p < .05) \), while teachers place more value on teaching patience \( (p < .05) \).

The post-hoc analysis revealed that the assessments of preschool principals and teachers, compared to those of parents, were higher in the case of the following values: empathy, cooperation ability, helpfulness, tolerance and respect for traditions \( (p < .05) \). In teaching children, principals, in comparison to parents, place more value on sense of justice, sense of humour, pride, respect and health \( (p < .05) \). Parents, on the other hand, compared to principals, place higher value on teaching children confidence and commitment \( (p < .05) \). Parents, compared to teachers, consider it more important that kindergartens value good education and commitment \( (p < .05) \).

There were also those among the respondents, who found some values not at all important, not important or rather not important. The most negative evaluations were given to the value pride. Altogether 21 respondents considered teaching children pride not at all important, 53 found it to be not important and 199 evaluated it as rather not important. Pride was interpreted differently by the respondents. Additional comments highlighted that Pride should be limited, otherwise one becomes haughty; Pride – is one proud to be an Estonian? Being proud about ones achievements, and principled behaviour and pride are values that have both positive and negative sides. Some respondents evaluated teaching children such values as principled behaviour, commitment, sense of humour, loyalty, persistence, respect for traditions, wisdom and good education as not at all important, not important or rather not important. Commentaries in the case of these values added that Teaching sense of humour is almost impossible, one either has it or not; Respect for traditions means for me rather that I understand them and Loyalty for me is related to submission and is often contrary to courage and honesty.
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<td>5.29</td>
<td>0.72</td>
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<td>10.39</td>
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<td>5.18</td>
<td>0.79</td>
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<td>1.72</td>
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<td>3.02</td>
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</table>
Only one parent, one teacher and one principal evaluated as rather not important to teach independence, persistence, commitment, courage, trust, sense of justice and honesty. Therefore, one can say that these values are considered very important to be taught to children. Two values, tolerance and health, received evaluations of 4 to 6 from all respondents, or in other words, they were considered rather important, important or very important.

Activities for Implementing Values Education in Preschool Child Care Institutions

As estimated by principals, teachers and parents of child care institutions, values are foremost taught to children by adhering to the group’s good customs/rules – the average assessment across the three groups was found (M = 5.60, SD = 0.60) (see Table 2). The transmission of values to children is implemented in the course of everyday communication (M = 5.56, SD = 0.62) and everyday activities such as eating, dressing, etc. (M = 5.50, SD = 0.64). Personal role models in values education are considered extremely important by principals, teachers, and parents of preschool child care institutions alike (M = 5.50, SD = 0.64). Based on average assessments across the three groups, the following are important in values education: traditional events (M = 5.46, SD = 0.64), children’s literature (M = 5.4, SD = 0.66), activities in nature (M = 5.42, SD = 0.72), the field of education and pedagogy “Me and environment” (M = 5.42, SD = 0.71), language and speech activities (M = 5.42, SD = 0.65), learning games (M = 5.41, SD = 0.68), and joint events with the family (M = 5.37, SD = 0.79). As estimated by principals, teachers and parents of preschool child care institutions, values are least transmitted through media education (M = 4.37, SD = 1.00), drama lessons (M = 4.79, SD = 1.01) and sports activities (M = 5.13, SD = 0.80).

All principals rather agree, agree, or fully agree (evaluations from 4 to 6) that values education takes place through music and movement activities, children’s free play, everyday communication, the group’s good customs/rules, and that values are also transmitted during learning trips and excursions, activities in nature, and language and speech activities. Only one principal did not agree that values education takes place through personal role models, traditional events, morning hobby groups, art activities, children’s literature, joint events with the family, sports activities, outdoor activities, celebrating folk holidays, learning games, mathematical activities and everyday activities. Therefore, for principals teaching values takes place through most of the activities in the day care centre.

All teachers rather agree, agree, or fully agree (evaluations from 4 to 6) that values education happens through traditional events, children’s literature, everyday communication, the group’s rules and through language and speech activities. Among the teachers there were slightly more respondents who answered in the case of some activities that they do not agree at all, do not agree or rather do not agree (evaluations from 1 to 3).

In the case of parents, no activities received only evaluations from 4 to 6. All activities, through which values education could take place, also received evaluations such as do not agree at all, do not agree or rather do not agree (evaluations from 1 to 3). Only one parent rather did not agree that values education takes place through everyday activities and learning games.
Table 2.
The Mean Values, SD, F-Value and Significance of Activities of Value Education According to Principals, Teachers and Parents

<table>
<thead>
<tr>
<th>Activities</th>
<th>Total</th>
<th>Principals</th>
<th>Teachers</th>
<th>Parents</th>
<th>F</th>
<th>Sig.</th>
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<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
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<td>Group’s good customs/rules</td>
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<td>5.72</td>
<td>0.54</td>
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<td>5.68</td>
<td>0.51</td>
<td>5.64</td>
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<tr>
<td>Everyday activities (eating, clothing themselves, etc.)</td>
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<td>0.64</td>
<td>5.63</td>
<td>0.60</td>
<td>5.58</td>
<td>0.60</td>
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<td>Personal role model</td>
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<td>5.69</td>
<td>0.53</td>
<td>5.63</td>
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<td>5.62</td>
<td>0.57</td>
<td>5.54</td>
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<td>0.61</td>
<td>5.58</td>
<td>0.57</td>
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<td>5.56</td>
<td>0.58</td>
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<td>0.66</td>
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<td>0.71</td>
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<td>0.60</td>
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<td>Language and speech activities</td>
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<td>5.51</td>
<td>0.60</td>
<td>5.51</td>
<td>0.62</td>
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<td>Learning games</td>
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<td>0.68</td>
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<td>0.66</td>
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<td>Joint events with family</td>
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<td>0.64</td>
<td>5.36</td>
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<td>0.76</td>
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Sig. = Statistical significance.
The ANOVA test indicates that principals, teachers and parents of preschool child care institutions provided similar estimations of values education through art activities and exhibitions of children’s artworks (see Table 2).

The post-hoc analysis revealed that the assessments of principals and teachers were very similar in terms of how values education is implemented in kindergartens. Principals and teachers provided different assessments only for joint events with the family, sports activities, media education and teaching folk sayings ($p < .05$). Assessments of principals with respect to the abovementioned four activities, compared to those of teachers, were higher. Assessments of parents with respect to values education were lower ($p < .05$) compared to those of teachers and principals.

**Discussion**

The first aim of the current study was to find out which values principals, teachers and parents consider important to be taught to children in preschool child care institutions. The respondents consider the following values as most important to be taught to children: honesty, health, helpfulness, cooperation ability, trust, tolerance, sense of duty and independence. In addition to the provided list of values, the respondents added caring, creativity and responsibility. A study by Tulviste (2013) revealed that parents considered trustworthiness, respect for others, working hard and independence the most important to be taught at home. In the present questionnaire, caring, creativity and responsibility were added to the 25 listed values as important to be taught to children. By way of comparison, the results of a recent American study pointed out that the most important value to be taught to children was considered to be responsibility; very important values to be taught to children also included independence, hard work and good manners (Pew Research Center, 2014). The Estonian Human Development Report provides an outline of values studies conducted over the past 20 years in Estonia. In this framework parents were asked which attributes they would like to see fostered in their children. Between 1990 and 2008 the importance of teaching children determination and perseverance has decreased in Estonia, while the number of people who believe that children should be raised to be religious and obedient has somewhat increased. Compared to the first half of the 1990s, the number of people who consider it important to raise children to be independent has decreased almost twice. Compared to 1999, the changes are less apparent. Around ten years later the majority of people still considered it important to teach their children decisiveness and perseverance, these are followed by obedience and independence, while only a small amount (7%) of Estonia’s residents believed that children should be raised to be religious (Realo, 2013).

Principals, teachers and parents of preschool child care institutions consider pride, principled behaviour and loyalty as less important values to be taught to children. Based on the results of the study at hand, it may be maintained that according to the mean evaluations, principals, teachers and parents alike consider it important that children are taught all of the values in preschool child care institutions. On a 6-point scale, respondents assessed on average all of the above noted values as rather important, important, or very important. Therefore, it is very important that all values are discussed with children in preschool child care institutions. Furthermore, one should discuss with children what values mean for them and what values they consider important. The respondents added the following comments to values: *Actually all values are similarly relevant; All
of them are important and it is even better if one supports the other; All of them are very important and I try to pass them on to children in my daily work and All are important, but some more than others.

At the same time it is interesting to note that there were also respondents who considered some values not at all important, not important or rather not important. One example is pride, which many respondents considered rather unimportant to teach to children. However, the meaning of values may vary for different people. According to the basic values theory of Schwartz (1992, 2012), some values may be very important for some people, while much less important or even unimportant for others. It should be highlighted that such values as tolerance and health were considered rather important, important or very important by all respondents in the current study.

Comparing the assessments of principals to those of teachers, it may be said that to a great extent both groups consider the same values important. Principals of preschool child care institutions place higher value on sense of humour, pride and inventiveness, while teachers, compared to principals, value patience more. Compared to principals and teachers, parents consider confidence, commitment and good education as more important. Based on the results of other studies, parents have also valued academic success more (Tulviste & Kikas, 2010; Veisson, 2009). Compared to parents, principals and teachers place higher value on teaching children tolerance, traditions, cooperation ability, helpfulness and empathy. In her study, Veisson (2009) also highlights higher assessments on the part of principals for soft values. It appears that principals and teachers value rather softer values, such as tolerance, helpfulness and empathy, among others. Parents consider it more important that the institution gives a good level of education, while soft values are seen as something secondary. Employees of educational institutions consider it probably more important that the development of the child is holistic – knowledge, skills, values and attitudes are developed simultaneously. The results of the current study can be used in educating principals and teachers of preschool child care institutions as well as parents. The results indicate that values hold an important place in learning and educational activities, and adults use various methods and activities for teaching them to children. Such values as honesty, health, helpfulness, cooperation ability, and tolerance received higher average evaluations from all respondents. At the same time it is important that adults discuss the meaning of these values with children and how they are manifested in children’s behaviour in daily life. One can conclude from the results that all values should be discussed with children; for example, what is considered good or bad in society and what is right or wrong. Children can also learn various values from free play, but this may also reveal those aspects we do not approve of. Therefore, adults should definitely pay attention to values and talk to children about topics that arise from free play.

The second goal of the study was to find out, as estimated by child care institution principals, teachers and parents, what means are used to implement values education. The respondents are of the opinion that values education in preschool child care institutions is foremost implemented by adhering to group rules/good customs as well as in the course of everyday communication and activities. Johansson et al. (2014) also point out in their study that values are manifested in the everyday life of an educational institution. They also claim that in teaching values, rules are important, and add that it is most essential that teachers involve children in the rule establishing process, and discuss rules and values with children.
The respondents of the current study indicated that personal role models are very important for teaching children values. A personal role model is considered to be very important in values education. Bandura’s Social Learning Theory states that “most human behaviour is learned observationally through modelling” (1977, p. 22). Sanderse (2013) also emphasizes the significance of role models in teaching.

Based on the mean results of the study at hand, it may be maintained that principals, teachers and parents of Estonian preschool child care institutions are of the opinion that values education is implemented through all of the activities listed in the questionnaire. While principals agree that values education in day care centres takes place through almost all the proposed activities, among teachers there were also such respondents, who did not agree that all mentioned activities contribute to values education. In the case of parents none of the proposed activities received only positive evaluations. Only one parent rather did not agree that values education takes place through everyday activities and learning games. In the case of other activities there were more such parents, who did not agree or rather did not agree with their role in values education.

Consequently, it can be said that values education in preschool child care institutions is implemented through everyday communication, everyday activities, games, traditional events, and all of the applied learning activities. Adult role models are essential in values education. Children follow the example of the teacher as an authority in their general attitude towards life, other people and values related issues. One imitates the realistic behaviour, which is associated and assimilated with the personality of the authority figure. Therefore, in everyday life a teacher must follow the norms he/she considers important, and to give further information about or talk about with the children (Krull, 2000).

So, the general conclusions are that principals, teachers and parents of preschool child care institutions consider the following values as most important to be taught to children: honesty, health, helpfulness, cooperation ability, tolerance, trust, sense of duty and independence. Principals consider it more important to teach children a sense of humour, pride and inventiveness, whereas teachers value teaching them patience significantly higher. Parents compared to principals considered it more important to teach children confidence and commitment. Parents compared to teachers considered it more important that kindergartens value good education. Values education in child care institutions primarily takes place by following the group’s rules and in the course of everyday communication and activities. Personal role models are considered to be very important in values education. The results indicate that principals, teachers, and parents should acknowledge that teaching values to children happens through everyday communication and daily activities. All adults display their values by acting as role models, and therefore, principals, teachers and parents should become aware of what values they want to teach children through their role modelling and what communication styles and actions they should use. It is important to discuss the rules one has to follow in a group or in society with children. The rules that adults intend to use with groups of children should be formulated together with the children.
Validity and Reliability

Reliability was measured separately for the two questions used in the current article. The question – Which values do you consider important to be taught to children? (values 1–25) – had a Cronbach’s Alfa of .930, and the question – Through which activities is values education implemented in the preschool child care institution? (activities 1–25) – had a Cronbach’s Alfa of .949.

The current study has several limitations, which should be taken into account. One of the limitations is that no pilot study took place for the questionnaire. Another limitation is that the majority of the respondents were women and to a great extent the results reflect women’s opinions and evaluations. Yet another limitation to be considered is the fact that the majority of the values in the questionnaire were psychological features of individual personality. In future the questionnaire should include different values featuring the characteristics of democratic society. In addition, the questionnaire could include work education, religious studies, and ethics, among others. To gather further evidence, a qualitative study should be carried out in order to ask preschool principals, teachers and parents to express their views on the results of the current study. It would also be interesting to find out why preschool principals, teachers and parents consider group rules as most important in teaching values. When possible, interviews should be conducted with principals, teachers and parents, as well as observations and case studies about how values are taught to children through various learning and educational activities. The results of the current study can be implemented in training teachers for preschool child care institutions.

The research at hand is to be continued. The personal values of principals, teachers and parents of preschool child care institutions were ascertained according to Schwartz’s Portrait Values Questionnaire (Ulavere & Veisson, 2015). This article provided an insight into those values that principals, teachers and parents of preschool child care institutions consider important to be taught to children, and through which activities values education is implemented in preschool child care institutions. The researchers are now planning to analyse the connection between the personal values of principals, teachers and parents and the values education related activities in child care institutions.

In conclusion, as stated in the UNESCO Roadmap (2014), in order to guarantee the sustainable development of society, it is first necessary to acquire values and attitudes, knowledge and skills. Shaping values and attitudes starts in early childhood; therefore, values education plays a vital role in learning and educational activities at preschool child care institutions.

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Educating for Hope in Troubled Times: Climate Change and the Transition to a Post-Carbon Future

David Hicks, 2014.
A Trentham Book. Institute of Education Press
202 pp.
ISBN 978-1-85856-553-8

In troubled times we are looking for some wise and effective solutions, but most of all, before even to think about dealing with any problem, we need a hope that solution is possible, that we are capable of it and that everything we do will make sense. The book by David Hicks is actually such a handbook of hope so needed for every educator in times when not only the global problems of sustainability are on agenda, but also the educators themselves in their profession mostly feel endangered, misunderstood, and undervalued. In this new book professor Hicks follows up the role of guide toward the future, continuing the facilitating path toward hope initiated in his previous books.

The book will be a useful and inspirational tool both for the pre-service and in-service teachers specialized in a whole range of disciplines, teacher educators, university academics, curriculum designers, educational decision makers, parents and even pupils themselves.

The book contains four parts related to the sustainability issue, human reaction to these issues, ways how to create hope for a future and tasks for educators as well as introduction and epilogue with references. The first part of book “Troubled times” consists of three chapters tackling several important ecological issues: climate change, energy issues, and limits of growth. The second part of book “Facing the challenge” entails the chapters on our feelings when encountering these issues, our vision of future and possibilities to accept the transition from old ways of life toward new sustainable living. The third part “Sources of hope” seems to be the most intriguing and innovative part of this book as it describes the nature of hope, potential of success stories for rising hope and ways how to visualize the future. The concluding part “Education for transition” focuses more on education matters suggesting both post-carbon scenarios and stating the main tasks for educators in the context of travelling toward a sustainable future.

The interesting and demonstrative approach has been used also for the structure of each chapter. The chapter starts with the description of problem, follows with posing the question – what needs to be done and concludes with the role of education for this specific issue and ideas for teaching. In terms of ideas for teachers, the author constructs these subchapters starting with the questions in four categories of knowing, feeling,
choosing, and acting. Then some important resources, including valuable materials and activities visualized in vignettes, are provided from the point of view of experienced educator and expert. Each chapter ends with the description of five things a school can do in terms of a given issue.

The book is easy to read even for a non-native English speaker, besides Hicks writes with passion and wisdom, touching sensitive controversies, exposing some myths and using the most recent scientific data and resources to justify his point. The book contains many examples from the UK.

Future without hope is a misery, hope without faith and active engagement – just an illusion.

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