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Meeting the Challenges of ESD Competency – Based Curriculum in a Vocational School Setting

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Abstract

Sustainability is becoming an integral part of vocational schools since schools are called to respond to the environmental crises and unsustainability issues in the community as well as to an unsustainable economic development. Vocational schools have to play a significant role is re-orienting students' frames of reference towards sustainability for a well-being of the Earth.

The aim of the article is to explore teachers' views on their gains of integrating sustainability and the use of sustainability pedagogies as a result of participation in three years long international project. The article reflects on teachers' efforts of reorienting the curriculum of a vocational school towards sustainability within the framework of the international Erasmus+ project *"Methods for ESD – competencies and curricula"* (MetESD), led by Vechta University.

Keywords: Competencies, curriculum, sustainability, system perspective, vocational school's venue.

The challenges of Incorporating Legislative Mandates into the Educational Curriculum

International awareness about sustainability was first introduced at the United Nations UNESCO-UNEP International Educational Program (1975). Since this initial step, a number of significant international documents have been ratified. Agenda 21 of the Rio Earth Summit prioritized the importance of Education for Sustainable Development (ESD). Those declarations have been endorsed by many universities and governments. Other important declarations such as the COPERNICUS Charter (COPERNICUS, 2002) and the Talloires Declaration in 1990 (*University Leaders for a Sustainable Future*, 2002) were realized by more than 291 higher institutions. *Global Action Program on Education for Sustainable Development* (GAP, ESD) (2014) was a follow-up program meant to commemorate the *Decade of ESD* (2005–2014). Its aim was to contribute to the goals of sustainable development of the 2030 agenda. The above documents are among the major legislative landmarks intended to re-orientate educational goals to integrating ESD knowledge, skills, and values into the education curriculum.

These landmark documents gave official sanction to the Goals of Sustainable Development (SDGs) and mandated that these goals be integrated into a quality program of education for sustainable development. The GAP programme (2014) outlined the following priorities for advancing the ESD agenda such as policy advancement, transformation of learning environments, capacity building of educators, empowering youth, and accelerating solutions at the local level. It was felt that at the local level new challenges would be revealed that needed to be included in a vocational education curriculum (Salīte, et. al. (2016); Salīte (2015); Iliško (2014)). The universities have actively responded to these legislative mandates and implemented them into their educational agendas. It therefore incumbent upon vocational school to recognize and act upon these policies.

Sustainability is rooted in the educational priorities set by the United Nation's Decade of ESD. The aim of the policy decision is to "encourage UNECE Member States to develop and incorporate ESD into their formal education systems to include all relevant subjects as well as non-formal and informal education" (UNECE, 2005, p. 2). The aim of the strategy is to equip educators with the competencies to include sustainable development in their teaching. Vocational schools are expected to take into account the priorities set in the Global Action Programme (GAP) on ESD that is endorsed by UNESCO Member States. These decisions require that the policies become a part of a planning process in vocational schools. In planning their strategies and future developments, a vocational school needs to work in line with the framework of Sustainable Development Goals (SDG) where education is considered to be one of the crucial factors to meet the requirements of the new SDG 2030 Agenda for Sustainable Development.

Mapping the Field: The Rationale of the Project

Daugavpils State Technical School provides vocational education and secondary vocational education. In total, 21 educational programmes are offered to students. These programmes are two or three years long and lead to Level II of vocational qualifications (theoretical and practical skills required for independent work as a skilled worker). These programmes include general secondary education requirements, but not the complete programme. It is for this reason; the school's graduates are not qualified to continue to higher education. The vocation school has opened a Competence Centre. In future this Competence Centre will have a strategic role in the sustainable development of the region. Considering the EU priorities and funds related to the development of the infrastructure for the vocational schools and raise quality education, this Competence Centre will play a significant role in a sustainable development of the city and vocational education. In the process of designing a strategy for the further development of this Centre, it is essential to integrate sustainability in the development of the vocational school.

The aim of the international project was to develop tools and competencies for integrating sustainability into a curriculum of a vocational school in order to raise the awareness among young people about sustainability issues. The project's activities were targeted to vocational students and teachers. During the project they were provided with diverse resources, weeks of training, and peer feedback. The aim of this study was to evaluate to what extent the project has been effective in promoting students' awareness of ESD as learned through sustainability pedagogies.

It was intended that one of the project's outcomes would be to equip teachers with knowledge on how to make a transition in their teaching from educating *about* sustainability to educating *for* sustainability. It was hoped that this change in the teaching approach would impact positively on students' values and behavior and encourage the agency among them to participate in a sustainable decision making process.

As a further goal was to develop teachers' understanding of ESD as a '*frame of mind*' while integrating sustainability into the curriculum. After mapping the field, it is apparent that ESD is gradually emerging as school policy; international projects are serving as an add-on in the curriculum of the vocational school.

Data Collection Methods

For the study, the authors carried out focus group and individual interviews with staff members of a partner vocational school. Two years into the project, the authors conducted five semi-structured interviews with the staff members of the partnering vocational school on their gains and concerns raised during the course of the project. For analyses of the interviews, the authors used interpretive methods by reviewing repeatedly interview notes and identifying common patterns. The reliability of the analysis was increased by the analyses of the interview data by four researchers. Interviews with the staff members focused on participants' previous experience, the potential to integrate ESD into curriculum design, and how work in the project modified their existing perceptions about learning.

In summary, the interview questions can be divided into four categories: What are your personal gains due to the participation at this project? What are the main gains from the participation in the project for your school? Which initiatives were the most effective for fostering innovations in the curriculum? How did participation in the project create change in your pedagogical approach? What barriers to implement new ideas did you encounter during the course of project? The interview data was analyzed in a detailed and a systemic way and the data was categorized.

Education for Sustainability as a Frame of Mind

Sustainability has multiple of meanings and various models that coexist and enrich one another. The notions of sustainability is interdisciplinary and includes, political, economic, environmental and cultural aspects. The core of ESD is to challenge unsustainable practices and to foster public awareness and knowledge about sustainability. It is intended to lead to the re-orientation of mindsets and dispositions of youth towards sustainability issues.

Sustainability pedagogies are considered to be innovative pedagogies that foster values that lead to behavior change and cause students to be more sustainability-oriented. Sustainability pedagogies are concerned with exploring moral questions and the values of students and developing ideas of sustainability as a frame of mind that may have far reaching educational implications (Bonett, 1999). Current pedagogies need to be reconsidered as a shift from the education *about* sustainability to education *in* sustainability and education *for* sustainability, allowing for alternative epistemologies and ways of knowing to emerge (Fien, & Tilbury, 2002). These pedagogies can foster sustainable

changes in students' mindsets. Sustainability pedagogies will help learners to evaluate critically their perspectives and behaviors in the context of sustainability. As Murray et.al., (2014) suggests, sustainability pedagogies may empower and equip students to move towards sustainability in their personal and professional lives.

First Blincoe (2009, p. 206) identified some critical tasks needed to achieve an *'education for transition'*. The starting point would be the rethinking of curriculum design by involving more intuition, imagination, wisdom, spirituality and more holistic approaches, as well as knowledge about the interdependence and interconnectedness of all things. This broad spectrum could involve teaching learners how to relate to other people and learn to become part of a community; thus, helping them to become more authentic as people by learning self-acceptance.

Defining ESD Competencies

In Latvia as in other nations the term *'competencies'* has become a social science buzzword that spans across many disciplines. ESD competencies were identified by the declaration of the United Nations *Decade on Education for Sustainable Development* (UNDESD) (2005–2014) at the ESD World Conference in Nagoya, Japan (2014). Currently, Latvia is undergoing a reform process to integrate competency–based learning into the curriculum. Under discussion are ESD competencies that are now the focus of many scholarly studies. Frisk and Larson (2011) provide a list of important ESD competencies, such as system thinking, long term thinking, stakeholder involvement, and action-oriented competencies. Similarly, Cabrian and Junyent (2014) have developed a theorethical framework of professional competencies, focused on future orientated skills that involve complexity strategies, critical thinking, decision making and the interconnectedness of disciplines (Cebrian & Junyen, 2014). Competencies are characterized as individual dispositions to self-organization that include cognitive, affective, intentional, and behavioral aspects to facilitate self-organizing actions in various complex situations (Rieckmann, 2012). It is essential to keep a holistic vision of competencies in mind, that contain cognitive, emotional, and social components; as well as behavioral aspects, and general aptitudes (Singh, 2015).

Development of ESD competencies are particularly important in a vocational school because vocational students need to become agents of change, both in their workplace and personal lives. They need to be able to identify unsustainability; thus, helping to bring about positive changes. Acquisition of sustainability knowledge and insight into these issues is not enough to create change. What is needed is a change of attitude and develop a sustainability as *'frame of mind'*. It means formulating competencies to enable students to participate in the societal process through testing sustainability issues. A functioning competency framework requires an intersecting, multifunctional and context-oriented set of skills and strategies. This requires transversal, multifunctional, and context-oriented competencies (Rieckmann, 2012).

The European Portfolio for Environmental Education offers a list of competencies, comprising cognitive and meta-cognitive competencies enabling one to learn about sustainability issues (awareness of environmental issues, awareness of complexity, uncertainty, application of knowledge, system thinking); action and behavioral competence enabling to involve students in solving environmental issues (change in a lifestyle, motivation,

decision-making, ICT skills, self-fulfillment); social and citizenship competencies (awareness of values, participation, responsibility, decision making, independence, respect for different views, team work, flexibility and optimism) (Pace, 2005).

Challenges for ESD Curriculum Design

Numerous attempts have been made to conceptualize a new curriculum as relevant for meeting the challenges of 21st century. Innovations are mostly related to designing new content by integrating ESD. Curriculum design begins with a philosophy aiming to see students become skillful professionals, problem solvers, and active players in building a sustainable community.

The curriculum planning begins with the formulation of purpose and willingness of the staff members to integrate sustainability as a concept as a frame of mind into the design of the current curriculum. The purpose of the curriculum is to offer integrated and coherent learning experiences that contribute to academic and professional learning development. The curriculum involves set of values and a contract between the institution and the society on what learners should acquire during their learning experience.

The design of the curriculum is supported by a theoretical way to view learning; whether it is student-directed and holistic, process-oriented and student-centered. It should be consistent with the pedagogies and strategies of delivery. A mistake that needs to be avoided is to claim that the lessons are holistic and student-centered but in reality are being delivered in a didactic way. This type of error can send mixed messages to learners. It is important that sustainability is defined not only as a theoretical concept but also is reflected in the content and delivery. Therefore, the teachers of a vocational school not only developed their theorethical understanding on building curricula via system perspective, but also have learned approaches and strategies to deliver a holistic curriculum.

Teachers were asked to reflect on a curriculum design from the systems perspective as a complex of interacting and interdependent processes that have a common purpose and that constitute a coherent whole. The health and the coherence of the system is determined by the fact that the system remains open and is intended to exchange energy with the community. The curriculum should be seen a coherent whole. The systems view does not prescribe or promote any particular teaching methodology. Rather it should be seen as a vehicle to think in a more systemic way. Briggs and Peat (1989) provided a description of systems as ultimately un-analyzable, irreducible into parts, because the parts are being folded into each other by iterations and feedback. Complex systems are often heterogeneous and made up of diverse elements (Larsen, Freeman & Cameron 2008). The interrelationships and connections among different elements of the system behave in a non-linear way (Larsen-Freeman & Cameron 2008). The complexity of curriculum development is determined by learners' differences and needs, the learning process, and various aspects of the school's management policy. Complex systems are open systems that allow energy flow, infusion and constant modification. It makes the system a self-organizing process after the initial chaos followed by the integration of innovative elements in praxis. Briggs (1992) emphasizes that reflection and feedback allows the system to evolve.

Adopting ESD Pedagogies

Integration of sustainability issues in the curriculum is not enough. It requires innovative ideas and approaches on how to facilitate a learning process to prepare students for developing sustainable futures.

This approach requires the use of sustainable pedagogies characterized by the use of problem-oriented, participatory methods and used in combination with formal and informal learning. Students need to learn how to deal with increasingly growing amounts of information, complexity and uncertainties by the use of critical thinking and problem solving methods. The new curriculum requires ESD pedagogy that is collaborative, inquiry-based, practice-oriented and transdisciplinary. ESD content need to be adapted to a current traditional disciplinary-build curriculum. It needs to be built on all levels: policy level, organizational, power, cross-disciplinarity on classroom practice level. The classroom interaction needs to be built on such principles as openness and democracy in a decision-making. It also requires teachers' creativity and innovative thinking in redesigning their teaching practice. Teachers need to relearn ways of transdisciplinary knowledge governance by the involvement of multiple stakeholders. As Lansu et al. (2013) and Dloha et al. (2013) argue, vocational school needs to develop a close cooperation with stakeholders, thus expanding a space of the formal educational setting.

Data Gained During Research

Interview data: Personal context (learnings)

The authors interviewed staff members of the vocational school on the main gains during the project. Prior to that projects' leaders and experts in the field who conducted training sessions for the team of teachers provided a safe learning space for the teachers with a rich texture of optionality by leaving room for a continuous experimentation and revisions of current teachers' perceptions. The staff members who took part in this study reported that they had gained a lot as a result of being part of this study. They had broadened their teaching competence, learned new methods of teaching ESD, and developed a new perception of sustainability from a systems perspective. There are few highlights that are discussed below:

Epistemological shudders

After completing the first training sessions, the teachers felt a slight discomfort or skepticism after acquiring newly obtained knowledge. The seminars have enlarged the teacher's frame of reference and evoked new ways of looking at things. Somerville (2007) describes this process as disorientation or *'epistemological shudder'* (Charteris, 2014) that causes confusion before new understanding is being generated. As one of the project participants admitted: "*At the beginning I was not clear how to fit the obtained information within the busy current academic discourse. Afterwards, I reflected on it and found some space how it can be incorporated in my current practice."* Data gained from the interviews indicated that the staff members payed more attention to processual learning. As one of the staff members commented: "*It was great to be a part of this international project when the experienced staff members demonstrated how sustainability methods work in practice and involved us in a participative learning process. It made a big difference to try the methods out rather than to read about them in a book*."

Another participant commented that she had tried some of the methods in practice, and she noticed significant changes, such as students' increasing motivation to take an active role in learning. Participative pedagogy fostered an open and inclusive dialogue among the participants of the project.

Critical Reflection

The participants employed ***critical skills*** for integrating the new knowledge into current practice: *"Obtaining new ideas during all workshops encouraged me to try out the methods out in my practice. While trying out the new methods, I have made content revisions about the outcomes of the educational process."* Teachers were trying things out, they were ready to rebalance and move responsibly with what emerges. When developing practical skills, teachers "avoided putting all eggs into one basket." They were persistent in exploring and testing the new discourse and ideas as opposed to the current ones.

Within the framework of the project there were project partners and professors from other countries who provided critical feedback about their experiences that gave room for improvement and further reflections. The teachers from the vocational school in Latvia also had a chance to observe lessons conducted by the teachers from the other project countries. Afterwards, as one of the teachers commented: "From the international perspective of the critical friends' visits to the schools, provided an opportunity for us to see that the innovations that are introduced in the vocational school in Latvia are similar the ones in other countries. Considering differences in diverse locations, we could see evident differences as well as similarities in what we were doing." Critical friends' visits allowed the teachers to take a critical look at their practice as well as to gain a valuable learning experience on integrating sustainability in their curriculum.

Interview Data: Institutional Level (Changes in a curriculum design)

After mapping the field and evaluating the current approaches to a curriculum design, the teachers took part in several international workshops where they learned new strategies and methods for teaching sustainability issues. The teachers made a commitment to try out the ESD strategies and integrate them into their subject matter. Before the start of the project, international experts in the field invited teachers to reflect on the purpose of ESD education: that it not only trained competent employees, but that it also empowered flexible and creative human beings.

Prior to this, international experts in the field invited teachers to reflect on the purpose of education for ESD so as to train not only skillful employees but also empowering integral, flexible and creative human beings.

Newly acquired knowledge and theories on ESD, particularly, system approach was in a constant process of negotiation and modification as appropriate for the local context of the school. The extent to which ESD was integrated in a curriculum depended on each participant's initiative, interests and engagement with the ESD. The project leaders defined sustainability as a continuous exploratory pursuit through open-ended learning. Administrative support of school leaders and school's environment that was open for changes and innovations has also served as a motivating factor for integrating sustainability in the school environment. As the head of the school commented: "School is trying to be ahead of time by integrating contemporary technologies and approach to teaching."

Interview Data: Group Context

The benefit of the international project was a new learning experience gained by working in a team of motivated and enthusiastic teachers. Participation in the project was strictly voluntary. During the first year of the project, all workshop sessions were followed by critical reflections in the group on which strategies were most relevant for curriculum design in particular contexts and their particular schools. The main emphasis of the project was to integrate sustainability within the currently existing curriculum design. The current curriculum was based on a result-oriented approaches, emphasizing knowledge building; while integration of sustainability required a more process-oriented pedagogy. The project's experts equipped teachers with knowledge, methodologies and imagination necessary to achieve these results and act together as a learning community.

During several intensive one week workshops offered by the leading exerts in the field, the teachers were engaged in a process of exploration of their current understandings in an environment that was conductive to learning. The experts provided a space were divergent interests, values, and constructions of reality could meet in one spot. Teachers were learning from each other and, as a result, became individually and collectively more competent. The differences in their views and beliefs become the key to the learning process. Social learning has been designed by the organizations to involve teachers in the processes of changes (Cramer & Loeber, 2007). Still, the research shows that transformative change in the learning process depend upon the willingness of the staff members to engage in such a process (Hegarty, 2008).

Barriers of Integrating ESD in the Curriculum

As the main barriers for developing an ESD-oriented curriculum, the teachers felt that there was not enough time to implement the participatory methods and little willingness among the staff members to challenge existing approaches to teaching. Among the main barriers to integrate a sustainability identified by the teachers in a vocational school was a lack of teachers' expertise, a lack of time to introduce other innovations in an overcrowded curriculum, as well as a lack of commitment.

As one of the teachers' commented: *"Learning new ways to teach sustainability by student-centered methods is very exciting, but the curriculum is so overcrowded that I cannot spend extra time trying out the suggested methods."*

Another teacher maintained: *"While trying out some of the newly acquired methods, I see that students are very motivated and interested to learn new things, but, unfortunately, I cannot use those methods on a regular basis due to a lack of time."*

Involvement of Multiple Stakeholders

The Vocational school has developed a cooperative relationship with sustainability oriented stakeholders from the diverse sectors. These relationships developed students' competencies to deal with complex regional issues. EC (2017) has issued the document stating the importance of multiple stakeholders' engagement on implementing Sustainable Development Goal.

Conclusions

There were a number of significant documents and declarations ratified by the governments of Latvia on ESD but they alone cannot ensure implementing sustainability at the institutional and the level of practice. Politicians have managed to put sustainability issues on the political agenda and raised awareness on sustainability concerns. Sustainability issues are complex and multidimensional, lately defined as "wicked ". They seek a long term thinking and acting by addressing the social, environmental and value aspects of human practices. Still, education for sustainable development is a gradual process and cannot be speeded up.

Sustainability challenges and approaches vary from institution to institution, and the definition of sustainability is variously interpreted as well as the definitions of sustainability are contested. Schools and higher institutions have always played a major role in introducing innovations and are ahead in thinking and acting for a well-being for all. While vocational school serves the globalizing market economy, it also serves as a source of innovations in sustainability.

Higher education institutions and schools are the appointed leaders of innovation in the society. Vocational education has played a special role in the global market economy and has often helped to realize innovations for sustainability.

The commitment to sustainability should be central to vocational schools to reflect more closely the statements of purpose and mission that are their stated guides. On a practical level, it should be reflected through the sustainable practices of an institution.

On the curricular level, change involves identifying current practices, framing learning outcomes, and designing appropriate learning activities and assessment tasks. After three years of continuous reflection and improvement related to this project, the teachers introduced some positive changes in their practices in regard to what and how they teach. As a result of their participation in the project, the involved teachers developed capacities to engage with sustainability issues and determine for themselves the ways in which sustainability can be introduced into their teaching and other activities.

The aim of the international project was to develop the tools and competencies for integrating sustainability into a vocational school curriculum in order to raise awareness of young people about sustainability development. The Project's activities were targeted to vocational school students.

The most important result of the project on Education for Sustainable Development (ESD), was the identification of key competencies that are required for a successful program in sustainable development. The individual and focus group interviews indicated how teaching practices had been changed and restructured to integrate these key competencies for sustainable development. The change and restructuring process had been invaluably assisted by feedback from colleagues and students.

The experience of participating in the international ESD project gave teachers insight into sustainability theories and concepts. The training seminars created opportunities for the teachers to apply their knowledge in a practical way. On a personal level, participation in the project provided teachers with a broader understanding of sustainability issues and enhanced their competencies to reflect on ESD practices.

Systems thinking become the approach of the project to link methods with content and give participants the opportunity to reflect on complexity and uncertainty of issues

and outcomes that ESD entails (Barth & Rieckmann, 2012). Systems thinking is understood as networked thinking, involving holistic and cybernetic thinking as well as complex problem solving.

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