RESEARCH AND INNOVATION IN EDUCATION FOR SUSTAINABLE DEVELOPMENT

Wim Lambrechts / James Hindson (editors)
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Imprint

Research and Innovation in Education for Sustainable Development. Exploring collaborative networks, critical characteristics and evaluation practices.

January 2016
ISBN: 978-3-902959-08-9

Publisher:
Environment and School Initiatives - ENSI, ZVR-Zahl 408619713, Vienna, Austria
Editors: Wim Lambrechts and James Hindson
Proofread: Wim Lambrechts
Assistance: Günther Pfaffenwimmer
Lay-out: Walter Reiterer

CoDeS has been funded with support from the European Commission. This publication of CoDeS reflects the views only of the author, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.
The Austrian Network “EcoLogising Schools” (ECOLOG)

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ABSTRACT
This chapter describes the Austrian ECOLOG programme and network as an example of a nation-wide school network in the field of education for sustainable development. Embedded in social network theories this network aims at greening Austrian schools. The network was established in 1996 and includes 450 schools in 2015. Evaluation results show that communication, the head teachers, the backing of the initiative by the Ministry of Education as well as the openness of the concept are important factors that support the network. The chapter concludes with some advantages and challenges of the development and maintenance of networks in general.

KEYWORDS
education for sustainable development, educational networks, environmental education

EDUCATION AND SUSTAINABLE DEVELOPMENT IN AUSTRIA
Current education debates in Austria focus, among other things, on the notion of sustainable development and environmental education and these debates have sparked a wider discussion on the nature of education in general (Rauch and Steiner, 2006). As with human rights, sustainable development may be regarded as regulatory idea (Kant, 1787/1956). Such ideas do not determine how an object is made, but serve as heuristic structures for reflection. They give direction to research and learning processes. In terms of sustainability this implies that the contradictions, dilemmas and conflicting targets inherent in this vision need to be constantly renegotiated in a process of discourse between participants in each and every concrete situation (Minsch, 2004). This is a challenge, but one that has considerable
potential to enhance innovative developments in education. In Austria, one of these is the creation of the ECOLOG school network that aims at ecologising schools and establishing a sustainable school culture. ECOLOG was set up as a network, not only to disseminate innovation and best practice, but also to fill a structural gap in the Austrian educational system.

THEORETICAL CONCEPTS OF NETWORKS IN EDUCATION

According to Castells (2000), networks constitute a new social morphology in society, where dominant functions and processes are increasingly organised around networks. These networks are enhanced through new information technologies that provide the material basis for their expansion throughout the entire social structure. Castells (2000) conceptualises his notion of ‘network’ as a highly dynamic, open system consisting of nodes and flows.

In the wake of these general societal trends and structural transformations, networks have also become increasingly attractive in educational systems. In the 1990s, systemic school modernisation processes were launched by policymakers, prompted by the need for reformatory change in the light of the results of international assessments such as the TIMSS and PISA studies. Since proclaiming “school autonomy” as key goal the central administration in Austria has focused more and more on contextual activities whilst delegating responsibilities to decentralised units (Posch and Altrichter, 1993; Fullan, 2007; Rauch and Scherz, 2009). Less bureaucratic steering generates a need for alternative ways of coordination (Altrichter, Rauch and Rieß, 2010), and intermediate structures (Czerwanski et al., 2002) such as networks are expected to fill a structural gap and take over functions traditionally assigned to the hierarchy. Ideally, networks are conceived as an interface and effective means of pooling competencies and resources (Posch, 1995; OECD, 2003). As intermediate structures, they manage autonomy and interdependent structures and processes and try to explore new paths in learning and cooperation between individuals and institutions.

Per Dalin’s (1999) description of how networks function in education is an important theoretical basis underlying the formation of the ECOLOG network. According to Per Dalin networks have four functions. Firstly they have an informative function which becomes visible in the direct exchange of practice and knowledge for teachers and schools, and through the network acting as a bridge between practice and knowledge. A second function is to enhance professionalism. Through networking, opportunities for further learning and competence development are encouraged by
the members who themselves establish learning function of the network. Trust is a prerequisite for cooperation within a network, it is the basis for the third function - the psychological function which encourages and strengthens individuals. The fourth function is the political function. The enforceability of educational concerns is based on the motto “together we achieve more” (Rauch, 2013).

In order to understand the development of education for sustainable development (ESD) in Austria through networks, social network theories might help. In this respect the authors consider the following aspect of a network to be paramount:

1. Mutual Intention and Goals (Liebermann and Wood, 2003);
2. Trust Orientation (McDonald and Klein, 2003; McLaughlin et al., 2008);
3. Voluntary Participation (Boos et al., 2000; McLaughlin et al., 2008);
4. Principle of Exchange (Win-Win Relationship) (OECD, 2003; McCormick et al., 2011);
5. Steering Platform (Dobischat et al., 2006);
6. Synergy (Schäffter, 2006);
7. Learning (Czerwanski et al., 2002; O’Hair and Veugelers, 2005).

The following section describes the establishment and structure of the ECOLOG network based on these network characteristics.

THE AUSTRIAN ECO-SCHOOLS PROGRAMME – EDUCATION FOR SUSTAINABILITY (ECOLOG)

ECOLOG is key action programme and network on the greening of schools and education for sustainability. The network was developed in 1996 by an Austrian team of teachers co-operating through the international project Environment and School Initiatives (ENSI) (Posch, 1999). It is a national support system with the aim of promoting and integrating an ecological approach into the development of individual schools. Attempts are being made to embed the programme in the federal states of Austria through regional networks. Overall coordination was originally undertaken by the FORUM Umweltbildung (FORUM Environmental Education) which operated as a contractor for the Austrian Federal Ministry for Education and Women’s Affairs (BMBF) and the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW). Since 2015 the Institute of Instructional and School Development (IUS) at the Alpen-Adria-University Klagenfurt has coordinated the network in cooperation with the BMBF. Within this setting the ECOLOG programme may itself have become sustainable and can be seen as an interface between environmental education and school development. By 2015, over 450 schools (out
of approximately 6,000 schools in Austria) with about 90,000 students are currently engaged in the network. Six University Colleges of Teacher Education also participate and many others are reached by the website, teacher in-service-training seminars and newsletters.

ECOLOG is based upon an ENSI approach (ENSI, 2014): The mutual intention and goal of network members and ESD-Schools is to analyse the ecological, technical and social conditions of their environment and, on the basis of these results, define objectives, targets, concrete activities and quality criteria, to be implemented and evaluated. Another objective is cooperation between schools, researchers, teacher education as well as instructional management. Students as well as all the other actors within schools should be involved in a participatory way and collaboration with authorities, businesses and other interested parties is encouraged. Areas of concern that the network focuses on include among others saving resources (eg energy, water), the reduction of emissions (eg waste, traffic), spatial management (from the classroom to the campus), the culture of learning (communication, organisational structure) health promotion and opening the school to the community. 

One area of work focuses on the reorientation of technical and vocational education and training in support of sustainable development and the transition to a green economy. Since 1992 a whole range of training on environmental, health and social aspects have been offered in Austrian vocational education and training system and curricula have been developed as a result.

How are ECO-Schools supported and what are the incentives?
In order to provide support, BMBF organises network support structures. The groups mentioned below meet twice a year centrally and also function in their regions. Most of the people involved know each other and collaborate in different projects as well as the network.

• The ECOLOG regional teams coordinate the network in their regions.
• The ENSI-Teacher team advises the Ministry as well as the ECOLOG regional teams regarding the further development of the network.
• The Scientific Advisory Board has an advisory role for the Ministry and for the central coordination of the network.

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1 The aims and principles of ENSI are described under the following link: http://www.ensi.org/media-global/downloads/Publications/197/TheroleofENSiinGlobal.pdf (page 4, principles of procedure).
The network of representatives of university colleges of teacher education also has an advisory and development role, especially for the university colleges. As stated above, the support provided by the BMBF and the IUS involves the coordination of the regional support teams that meet twice a year to exchange information, the maintenance of the website (www.oekolog.at), the publication of periodical news, the organisation of events and seminars, synergies with the regional science networks of the “Innovations make schools top – IMST” project, international contacts (EU projects), as well as evaluation and research. Furthermore, cooperation with the FORUM Umweltbildung provides educational materials, events and contacts with other stakeholders in the field of ESD.

The inclusion of the BMBF in the network as well as representatives of university colleges of teacher education enhances the application and adoption of educational concerns, an important aspect of the political function of a network (Dalin, 1999).

At a regional level, support is provided by the ECOLOG regional teams. Their major task is to organise further education and training and to promote the exchange of experience between schools so that teachers may benefit from the growing pool of ESD competence. In addition, the regional teams provide annual regional activities and events aimed at all ECOLOG schools of the federal state. As a link between practice and knowledge, the regional teams fulfil the information as well as the learning function of a network. The regional teams are made up of people nominated from the regional school boards and the regional university colleges of teacher education. One of the ENSI teacher team is also a member of a regional team. In some provinces the ECOLOG regional teams have managed to establish co-operation with the Environment Departments of the provincial governments and with NGOs, and have been able to access financial support for the ECOLOG network schools. Participation in the ECOLOG network is based on trust orientation and volunteering both of which are related to the psychological function of networks.

Three other measures of support provided are: Seminars for heads and coordinators to enhance the quality of ESD in schools; an Education Support Fund for Health Education and Education for Sustainable Development and a National Environmental Performance Award for Schools and University Colleges of Teacher Education (Rauch and Pfaffenwimmer, 2014).

The Austrian ENSI-Teacher team has been involved in the development of the ECOLOG programme from the beginning and is the link with the international ENSI
The advantages for schools participating in the ECOLOG network are fourfold. Schools receive a starter kit which includes information about sustainable school development and suggestions for concrete measures and projects as well as an access to freely available publications. Schools may also apply up to EUR 1,200, for a project that deals with environment and sustainability from the Education Support Fund for Health Education and Education for Sustainable Development. To make the schools’ achievements visible, annual school reports are published on the ECOLOG website. Another benefit is that ECOLOG schools have a good pedagogical and organisational basis on which to work towards the Eco-Label for Schools and University Colleges for Teacher Education. Finally the ECOLOG programme acts as a good foundation for school quality management initiatives as it uses a common structure for planning and reporting.

**Evaluation of the ECOLOG Programme**
Throughout the 19 years of the ECOLOG Programme, a series of evaluations and studies have been written: Thonhauser et al. (1998), Ehgartner (1999), Rauch and Schrittesser (2003) and Rauch and Dulle (2011). These evaluations are based on a mixture of interviews with teachers, head teachers, and facilitators of schools as well as on observational data and an analysis of material produced by the schools. Payer et al. (2000), Schober-Schlatter (2002) and Knoll and Szalai (2009) used questionnaires and Heinrich and Mayr (2005) did a cross-case-analysis of the reports of the regional networks. These evaluations highlighted a number of factors that have been critical to the success of the network.

Communication has proved to be the central element allowing schools to produce a common understanding of ESD. Communication is a key precondition for learning by all members of the school community (i.e. Thonhauser et al., 1998; Ehgartner, 1999).

Head teachers play an important role through their “official” support of the project shown through actions such as putting sustainability on the agenda of teachers’ conferences and by repeated statements of support in the public arena. In addition, heads enhance motivation by recognizing small steps with photos or an information wall by maintaining contacts outside the school through public relations and the media and by providing incentives, through for example, negotiating financial
support with the body responsible for maintaining and financing schools (Payer et al., 2000; Schober-Schlatter, 2002).

The backing of the initiative by the Ministry is also seen as a motivating factor. The homepage of the network (http://www.oekolog.at) is an important source of information. Regular in-service training workshops for teachers provide time and space for meetings, bringing people together face-to-face and giving them a sense of identity. Activities in the future will focus on the need to maintain funding, to develop local advisory support further and to develop quality assessment and educational standards. Support should also include a revised political mandate, strengthened quality assurance (agreements on goals that are clear and achievable), early feedback on feasibility, quality monitoring, scientific support, and continuing the resource base (material and non-material incentives) (Rauch and Schrittesser, 2003; Heinrich and Mayr, 2005).

The openness of the ECOLOG concept allows a wide range of issues to be included and fosters creativity. Its impacts are seen in different areas, such as a change in teaching methods resulting in more project work and social learning, the increased integration of health education e.g. through the availability of healthy snacks, including ecological and social issues in lessons and considering the design of buildings such as the school yard and energy optimization of the school. Participation in ECOLOG results in an enhancement of a schools image and a further development of external relations such as those with the community (Rauch and Dulle, 2011).

ECOLOG schools that are living out a sustainable culture can influence the environmental consciousness and competencies of pupils in a positive way through for example demonstrating a sustainable use of resources. Approximately one third of the 23 ECOLOG schools that were surveyed in one evaluation noted an increased consciousness and self-reflection by pupils towards sustainability topics including a greater awareness of resources use, eating healthy snacks and changes in shopping habits. Addressing values and the interconnection of knowledge are especially important. Having said that, the importance of a school should not be overestimated as it is only one influencing factor among many. Some schools successfully involved parents in sustainability activities and this is another supporting factor. More primary schools than secondary schools managed this (Rauch and Dulle, 2011).

On the one hand ECOLOG is an active network due to the personal engagement of individual teachers. On the other hand it is necessary to establish a culture of
teamwork to enable the development of a sustainable school culture. This is a challenge for schools (Rauch and Dulle, 2011).

ECOLOG schools are committed to quality development and assurance. The production of annual reports along the lines of a school development plan caused some difficulties in the beginning. After 10 years, schools have written these reports with greater ease and the ECOLOG annual report is seen as a helpful tool for reflection and planning. ECOLOG supports quality development through the definition of visions and aims such as the shaping a liveable world and the perception of nature as a whole. Furthermore, ECOLOG offers a broad range of evaluation and reflection methods and as a result contributes to the implementation of legal provisions like the quality management of educational standards (especially in science) (Rauch and Dulle, 2011).

RESUME AND OUTLOOK
The example of the ECOLOG school network shows that the theoretical concept of networks, including the seven aspects from literature and the four functions of networks according to Dalin (1999) serve as a good basis for the establishment of a national ESD network in education.

The ECOLOG network carries out creative projects and through these tries to raise the attractiveness of ESD. Based on the example of ECOLOG the following points can be made about networks in general.

- Networks in education offer goal-oriented exchange processes among teachers (information function) which support the professional development of teachers through providing fresh ideas for classroom teaching and encouraging interdisciplinary cooperation in schools for example (learning function).
- Networks have the potential to create a culture of trust, with the effect of raising self-esteem of, and risk-taking by, teachers (psychological function) and in particular of upgrading science at school (political function).
- Good practice cannot be cloned, but exchanging experience on a personal level promotes learning and innovation.
- It is necessary to maintain a balance of action and reflection (goal-directed planning and evaluation) and autonomy and networking (analysis of one’s own situation). Critical friends are also useful when setting up a sustainable support system for schools.
• Evaluation and research needs to be driven by an active link between the interest in gaining new knowledge and a developmental interest. A culture of self-critical and collective reflection might flourish, but reflection should not hamper a project from being taken forward. When maintaining a network, the case of the ECOLOG network shows that there are a number of risks. These include that
• the network moves away from the interests of the stakeholders;
• common visions and goals disappear;
• the network fails due to weak coordination and steering;
• the network fails due to a lack of resources (money and time);
• the network mutates into a bureaucracy.

The overall challenge might be described as keeping momentum between structures and processes or, in other words, between stability and flow, to enable sustainable development and learning.

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