

THE AUSTRIAN ECOLOG SCHOOLS NETWORK: RESULTS OF A QUANTITATIVE EVALUATION

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ABSTRACT

This paper describes networking for education for sustainable development within the Austrian ECOLOG-schools network. It discusses theoretical concepts of Education for Sustainable Development and school development from an Austrian perspective, as well as networks in education in general and the organisation of the ECOLOG-network in particular. ECOLOG is a programme and network for the greening of schools and education for sustainability in Austria. For 25 years, over 700 ECOLOG schools and 13 colleges of teacher education have been integrating an ecological approach into their everyday school life and school development. Throughout the ECOLOG-schools network's existence, a series of evaluations, inquiries, and studies have been produced (Rauch & Pfaffenwimmer, 2020). Based on these evaluations and to obtain current quantitative data on the implementation of ECOLOG at the participating schools, a questionnaire survey was sent to all ECOLOG school coordinators with 154 respondents (25% response rate) in the school year 2018/19, with the aim of deriving relevant measures to support ECOLOG schools. The results show that the coordinators implemented the ECOLOG principles in their everyday school life through environmentally conscious actions, while pupils learned how to deal with limited resources and were exposed to new ways of thinking and working. However, there is still room for improvement, for instance in shaping cooperation with out-of-school partners.

KEY WORDS

environment; quantitative methods; environmental education; educational networks.



SISYPHUS

JOURNAL OF EDUCATION

VOLUME 11, ISSUE 02,

2023, PP 94-107

DOI: <https://doi.org/10.25749/sis.28591>

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A REDE AUSTRIACA DE ESCOLAS-ECOLOG: RESULTADOS DE UMA AVALIAÇÃO QUANTITATIVA

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RESUMO

Este artigo descreve o trabalho em rede - networking - na educação para o desenvolvimento sustentável dentro da rede austríaca de escolas-ECOLOG. Analisa os conceitos teóricos de Educação para o Desenvolvimento Sustentável e de desenvolvimento escolar do ponto de vista austríaco, bem como as redes em educação em geral e a organização da rede-ECOLOG em particular. O ECOLOG consiste num programa e numa rede para a ecologização das escolas e a educação para a sustentabilidade na Áustria. Há 25 anos que mais de 700 escolas ECOLOG e 13 escolas de formação de professores integram uma abordagem ecológica na sua vida escolar quotidiana e no desenvolvimento escolar. Desde que a rede de escolas-ECOLOG existe, tem-se produzido uma série de avaliações, inquéritos e estudos (Rauch & Pfaffenwimmer, 2020). Com base nestas avaliações e para obter dados quantitativos atuais sobre a implementação do ECOLOG nas escolas participantes, enviou-se um inquérito por questionário a todos os coordenadores de escolas ECOLOG, tendo havido 154 respondentes (taxa de resposta de 25%) no ano escolar 2018/19, com o objetivo de extrair medidas relevantes de apoio às escolas ECOLOG. Os resultados mostram que os coordenadores implementaram os princípios ECOLOG na vida escolar quotidiana através de ações ambientalmente conscientes, à medida que os estudantes aprenderam como lidar com recursos limitados e foram expostos a novas formas de pensar e de trabalhar. Porém, ainda há por onde melhorar, por exemplo na definição de cooperação com parceiros externos à escola.

PALAVRAS - CHAVE

ambiente; métodos quantitativos; educação ambiental; redes educativas.



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LA RED AUSTRIACA DE ESCUELAS-ECOLOG: RESULTADOS DE UNA EVALUACIÓN CUANTITATIVA

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RESUMEN

Este artículo describe el trabajo en red para la educación para el desarrollo sostenible de la red de escuelas-ECOLOG de Austria. Analiza los conceptos teóricos de la Educación para el Desarrollo Sostenible y el desarrollo escolar desde el punto de vista austriaco, así como las redes en educación en general y la organización de la red ECOLOG en particular. ECOLOG es un programa y una red para la ecologización de las escuelas y la educación para la sostenibilidad en Austria. Durante 25 años, más de 700 escuelas ECOLOG y 13 escuelas de formación de profesores han integrado un enfoque ecológico en su vida escolar diaria y en el desarrollo escolar. A lo largo de la existencia de la red de escuelas-ECOLOG, se han producido una serie de evaluaciones, encuestas y estudios (Rauch & Pfaffenwimmer, 2020). Con base en estas evaluaciones y para obtener datos cuantitativos actuales sobre la implementación de ECOLOG en las escuelas participantes, se envió una encuesta a todos los coordinadores escolares de ECOLOG, con 154 encuestados (tasa de respuesta del 25%) en el año escolar 2018/19, con el objetivo de extraer medidas de apoyo relevantes para las escuelas ECOLOG. Los resultados muestran que los coordinadores implementaron los principios de ECOLOG en la vida escolar cotidiana a través de acciones ambientalmente conscientes, mientras que los alumnos aprendieron cómo lidiar con recursos limitados y fueron expuestos a nuevas formas de pensar y trabajar. Sin embargo, todavía hay margen de mejora, por ejemplo, en la configuración de la cooperación con socios extraescolares.

PALABRAS CLAVE

ambiente; métodos cuantitativos; educación ambiental; redes educativas.



SISYPHUS

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The Austrian ECOLOG Schools Network: Results of a Quantitative Evaluation

Franz Rauch¹, Mira Dulle

INTRODUCTION

While Environmental Education (EE) is regarded as the one main current in education for sustainable development, global learning may be regarded as the other one in Austria. In the 1990s, development-policy education was gradually replaced by the concept of global learning. With the globalisation of all walks of life and the emergence of the idea of global citizenship, education was faced with new challenges. Since the 1992 Earth Summit in Rio, the preferred policy discourse has shifted from EE to a broader vision: Education for Sustainable Development (ESD). As a result, apart from ecological issues (consumption of resources, pollution of the environment, demographic explosion etc.) EE, on a normative level, was now determined by the idea of fair global distribution, forming a new mix of ecology, economy, as well as social, political and ethical dimensions. (Rauch et al., 2023).

Sustainable development may be regarded as a regulative idea (Kant, 1787/1956). Such ideas serve as heuristic structures for reflection. This means that the contradictions, dilemmas, and conflicting goals inherent in this vision need to be constantly renegotiated in a process of discourse between all participants involved in each and every concrete situation (Minsch, 2004). This is a challenge but has considerable potential to enhance learning in education as well (Rauch, 2015). A central goal is the transformation of individuals, organizations and the society. Learning is transformative “when the learners, integrate and reinterpret knowledge into their own frames and put it into practice in their own lives. Learning is also one mechanism for changing the society and for transforming the society” (Reardon, 2010, p. 9).

THE ECOLOG PROGRAMME

To support transformative learning and implement ESD at school, the Austrian ECOLOG programme and network was developed in 1996 by a team of teachers working on the international ENSI project (Affolter & Varga, 2018). ECOLOG is a national support system with the aim of promoting and integrating an ecological approach into the development of individual schools and attempts are being made to embed the programme in Austria's federal states through regional networks. The ECOLOG network is structured in three levels to support schools in the ECOLOG programme: (1) the coordination by the Institute of Instructional and School Development (IUS) at the University of Klagenfurt in partnership with the Federal Ministry of Education, Science and Research (BMBWF; (2) nine ECOLOG regional teams (one in each Austrian province) in collaboration with educational and environmental authorities, university colleges of teacher education and various organizations of environmental education; and (3) ECOLOG coordinators and

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teams in all ECOLOG schools. Central support in ECOLOG is provided by the BMBWF and by the IUS. Additional support measures are provided by the FORUM Environmental Education (an NGO), via seminars for heads and coordinators of ECOLOG network schools, the Education Support Fund for Education for Sustainable Development, as well as via the National Environmental Performance Award for schools and university colleges of teacher education (Rauch & Pfaffenwimmer, 2019).

Networks constitute a new social morphology in society, where dominant functions and processes are increasingly organized around networks with digital technologies as basis for a global expansion (Castells, 2000). According to Per Dalin (1999) networks in education have an informative function, which becomes visible in a direct exchange of practice and knowledge for teaching and schools, and act as a bridge between practice and knowledge. Extended opportunities for learning and professionalization are encouraged by networks and trust is a prerequisite for cooperation. It enables the psychological function of a network to strengthen individuals. In the political function of networks, enforceability of educational concerns increases.

Since the 1990s school autonomy is a goal of the central administration in Austria. This means more contextual steering activities by delegating responsibilities to decentralised units (Fullan, 2007; Posch & Altrichter, 1993). Less bureaucratic steering generates a need for alternative coordination. Intermediate structures (Czerwanski et al., 2002) such as networks are conceived to fill a structural gap and take over functions traditionally assigned to the hierarchy.

ECOLOG is a programme for school development and aims to implement ESD as a whole-school approach (Henderson & Tilbury, 2004). Beyond describing pedagogical school development as a triad made up of teaching development, personnel development, and organizational development (Holtappels & Rolff, 2004) the currently published model for ESD effective schools from Verhelst et al. (2020) is particularly relevant for the ECOLOG schools. The model consists of six interconnected characteristics: *shared vision, pluralistic communication, supportive relations, collective efficacy, adaptability and democratic decision making*. They are embedded in the context of *sustainable leadership* and the *school resources*.

ECOLOG-Schools analyse the ecological, technical, social and economic parameters of their environment and define targets, concrete activities, and quality criteria to be implemented, evaluated and further developed. In this respect, the approach corresponds to action research (Rauch, 2016). In addition to teachers, students as well as non-teaching-staff, parents and stakeholders should be involved in a participatory way. Cooperation with school authorities, business enterprises, NGOs and others is encouraged. The measures concern areas like saving resources (i.e., electricity, water), reduction of emissions (i.e., CO₂, waste), designing of school grounds (i.e., school garden), the culture of learning and teaching (communication, organisational structure), health promotion, social and global learning, as well as the opening of the school to the community. The current international United Nations programmes like Sustainable Development Goals (especially goal 4 “for Quality Education”) (United Nations, 2016) and the 2014 UNESCO Global Action Programme on Education for Sustainable Development are in line with the conceptualization of ECOLOG.

All in all, over 700 schools (approx. 12% of Austrian schools) with about 20,000 teachers and approximately 150,000 students as well as 13 (out of 14) university colleges for teacher education are currently part of the network. Many others are reached through the website, teacher in-service-training seminars, and newsletters.

EVALUATION METHOD AND PROCEDURES

Throughout the past 25 years of the ECOLOG-schools network's existence, a series of evaluations have been produced (Rauch & Pfaffenwimmer, 2020). Most of these are qualitative accompanying studies (including, Fleiß, 2016; Lehner 2016; Rauch & Dulle, 2011; Ziener, 2017). To get a better overview of a larger part of the ECOLOG network, quantitative data should be generated by means of a questionnaire survey with the ECOLOG school coordinators. The aim of the survey is to gain an overview of ECOLOG-relevant measures and activities at participating schools. Furthermore, areas for improvement and support systems should be identified, to provide evidence-based recommendations and to be able to further develop the support systems for future activities within the framework of ECOLOG. In addition, it was an urgent concern of the evaluation team to find out how public relations work is carried out at the schools, which challenges, restrictions but also chances coordinators at the ECOLOG schools see. In addition to generating knowledge, the information should primarily serve the further development of the ECOLOG school network and programme.

The questionnaire developed contained self-formulated items as well as some adapted items from the Federal-State Commission Germany project "21" questionnaire (Rode, 2005). After a pilot study with 20 coordinators (carried out at the end of March 2019), some items were adapted. After this piloting, the questionnaire was uploaded to www.umfrageonline.com and the target group (coordinators at ECOLOG schools) was asked to participate by mail (Swatek & Rauch, 2020).

A questionnaire was developed which contained self-formulated items as well as some adapted items from the Federal-State Commission Germany project "21" questionnaire (Rode, 2005). After a pilot study with 20 coordinators (carried out at the end of March 2019), some items were adapted. Descriptive statistics (means, Cronbach-Alpha) as well as inductive statistics (regression analysis) describe a status-quo of ECOLOG schools in Austria. The SPSS programme was used for the statistical calculations.

The following section presents some findings. Descriptive results are presented in summarized form and partly displayed with diagrams; factor analyses or reliability analyses were used to calculate the mean value. Mean values were examined for significant differences between school types using an analysis of variance. Unless otherwise stated in the following section, no significant differences in mean values apply to the scales, which is why an evaluation of the respective scales and constructs according to school types does not appear to be meaningful.

RESULTS

At the time of the survey, there were 572 schools in the ECOLOG network. The survey was sent to the coordinators of all ECOLOG schools. The response rate was 25% of all coordinators (N = 146), 77% of whom are female. Elementary schools make up the largest share of the sample (38%), followed by secondary upper schools (28,5%) and secondary lower schools (33,3%). The head teacher is part of the ECOLOG team in 69% of the participating ECOLOG schools. In 66% of the cases, the (former) school leader was responsible for joining the ECOLOG network. 33% state that the ECOLOG coordinators initiated the joining of the network. In 58% of the participating schools all pupils are involved in ECOLOG. Pupil participation is highest in elementary and new middle schools. In the other school types, about 58% of the students participate.

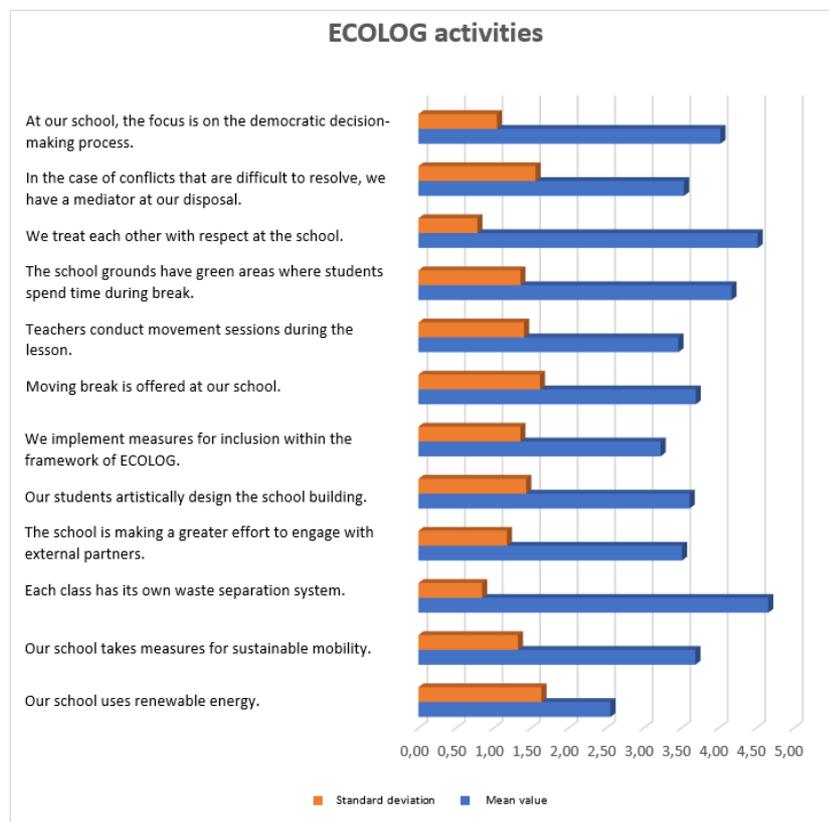


ECOLOG ACTIVITIES

ECOLOG is addressed differently in the different types of schools. While in elementary schools ECOLOG is a topic in almost all subjects, the participation in subjects decreases as the level of education increases. Although a number of subjects are also addressed in secondary schools, biology proves to be one of the subjects in which ECOLOG projects are most frequently carried out in all school levels.

Figure 1 shows a selection of ECOLOG activities. Each class has its own waste separation system (MW = 4.66, SD = 0.85). Furthermore, an appreciative interaction is cultivated at ECOLOG schools (MW = 4.52, SD = 0.78). At ECOLOG schools, however, renewable energies are hardly used (MW = 2.56, SD = 1.64). The implementation of physical activity units during the lesson (MW = 3.54, SD = 1.56) also hardly plays a role at ECOLOG schools.

Figure 1
ECOLOG activities

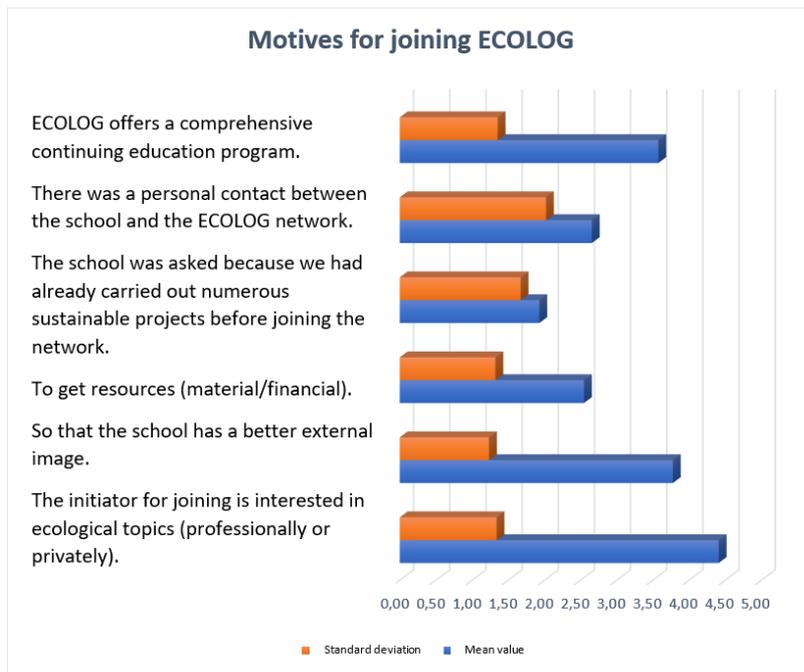


MOTIVATION TO JOIN ECOLOG

The main motivations for schools to join the ECOLOG Network are the personal and professional interest in ecological issues of the initiator (MW = 4.41; SD = 1.34), see figure 2. The second most pronounced motive is the improved external image of the school (MW = 3.78, SD = 1.23) followed by the motive of further education opportunities offered

by ECOLOG (MW = 3.57, SD = 1.35). In order to analyse whether the mean values of the motives differ significantly from one another in the comparison groups (school types), a single-factor analysis of variance was performed. The analysis shows that the mean values do not differ significantly from one another, which is why a differentiated presentation based on the types of school is not provided.

Figure 2
Motives for joining ECOLOG



PUBLIC RELATION STRATEGIES

In terms of public relations strategies, the responses indicate that elementary schools increasingly address the local community directly by, for instance, inviting parents and the Mayor to school projects. Secondary middle and secondary upper schools, on the other hand, prefer websites and media coverage. The public relations work in both print and online media, as well as the use of the ECOLOG-Logo, can and should be expanded in the future.

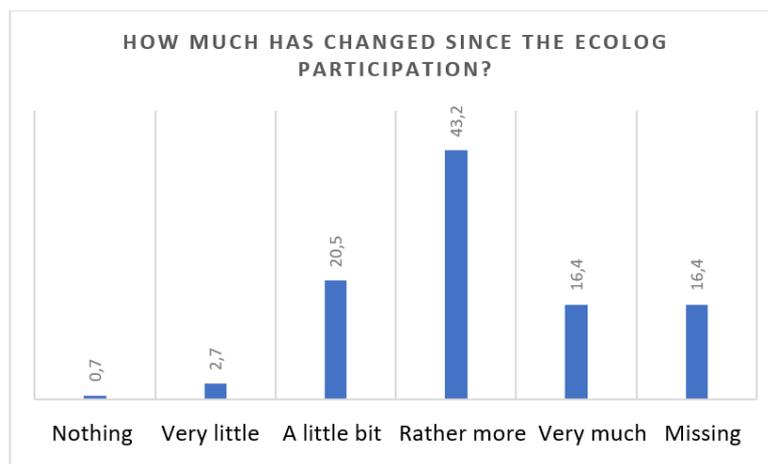
ECOLOG is part of the school programme in only 32% of the participating schools. On the other hand, it is encouraging that 61% of the coordinators state that ECOLOG can be found in the school's mission statement.



ECOLOG AS PART OF THE SCHOOL LIFE

It is evident that the participating coordinators integrate ECOLOG into their everyday school life and can obviously identify with the contents. In general, a positive attitude can be seen among the participants (MW = > 3.50). ECOLOG is generally very strongly represented in everyday school life and has a high value at the schools (MW = > 3.00), but is relatively little discussed in conferences (MW = 2.96, SD = 1.22). Figure 3 shows that at 60 % of the participating schools rather more or very much has changed due to ECOLOG. This speaks for many perceived changes through the participation in ECOLOG.

Figure 3
Changes at the school since joining ECOLOG



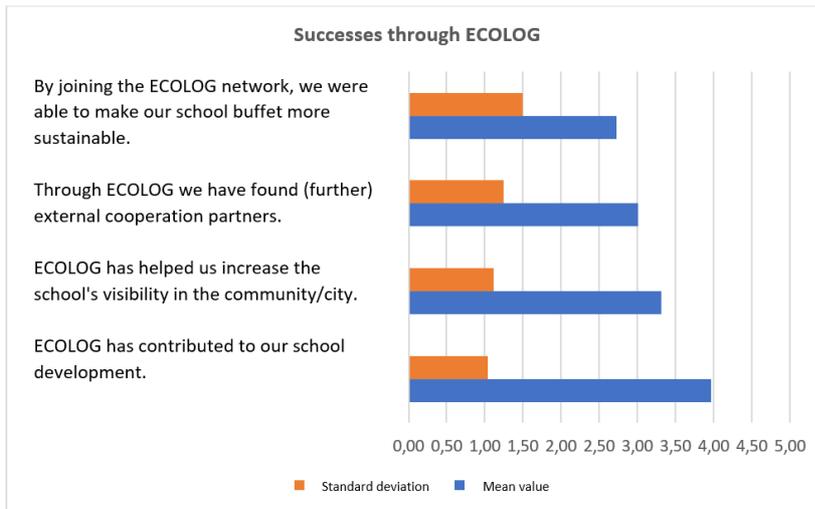
SUPPORT IN THE ECOLOG PROGRAMME

Teachers at ECOLOG schools are supported by the coordinators, particularly through their motivating teachers to carry out ECOLOG activities with their students (MW = 3.99, SD = 0.98). Furthermore, the experience exchange within the ECOLOG network (e.g., at network meetings) proves to be a valuable support for the coordinators. The information on the ECOLOG website (MW = 3.64, SD = 0.92) and ECOLOG network's materials and brochures (MW = 3.59, SD = 1.05) are especially considered beneficial.

SUCCESSES CONNECTED WITH ECOLOG

The following chart shows which items were measured on the success scale. The positive contribution to school development through ECOLOG is particularly noteworthy (MW = 3.96, SD = 1.04). The transformation of the school buffet to a more sustainable one, on the other hand, is of less importance (MW = 2.73, SD = 1.49).

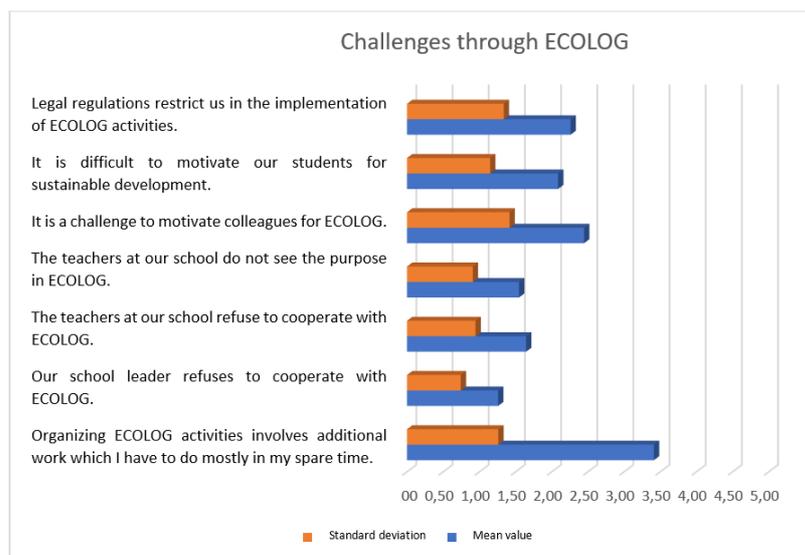
Figure 4
Successes through ECOLOG



CHALLENGES CONNECTED WITH ECOLOG

The following chart shows that the main challenges mentioned is the additional workload of teachers who have the role of coordinators (MW = 3.41, SD = 1.26). Another challenge is that school heads infrequently provide additional resources (MW = 1.82, SD = 1.32). Furthermore, the lack of some colleagues' participation in in the ECOLOG programme (MW = 2.45, SD = 1.42), as well as legal regulations which make implementation difficult, are named as challenges.

Figure 5
Challenges through ECOLOG



LEARNING OF STUDENTS

The coordinators of all school types indicate that the waste separation systems are used sustainably by the students (MW = 4.37, SD = 0.92). Furthermore, the coordinators also report health-related aspects (e.g. a moving break or healthy snack) as a positive effect for the students (MW = 4.18, SD = 1.07). A significant effect is that students learn to manage limited resources (MW = 4.31, SD = 0.83); coordinators also report that students develop a solution-oriented mindset (MW = 3.74, SD = 1.04). A non-significant comparison of school types shows that coordinators at elementary schools generally report higher mean values in their evaluations of the impact on students than coordinators at other types of schools.

NETWORKING AND COOPERATION

In addition to the ECOLOG network, about two thirds (65%) of the participating schools are active in other school networks. Especially the networks “healthy school”, “climate alliance” and “eco-label” are mentioned by the coordinators.

The analysis of variance showed that elementary schools cooperate significantly more often with the parents' association or the municipality than vocational schools. Overall, however, the cooperation with the school environment could be expanded. It turns out that schools cooperate more often with the parents' association and with blue light organizations than with universities, companies, and industries.

DISCUSSION AND CONCLUSIONS

Overall, the results show that the coordinators anchored the ECOLOG principles in the everyday school life through environmentally conscious actions involving the pupils in concrete activities and reflections. But there is still room for improvement, for instance with respect to cooperation with out-of-school partners.

Elementary school teachers rate ECOLOG best. Results from previous studies (Rauch & Dulle, 2011; Ziener, 2017) likewise confirm, that the implementation of ECOLOG is most successful at primary level. This can be explained due to the structure of primary schools. But there are also good examples of higher schools. However, previous studies (Fleiß, 2016, 2018; Lehner, 2016; Rauch & Dulle, 2011; Ziener, 2017) show that – independent of the school type – in some schools ESD is already integrated into the daily school life while in others the path still needs to be taken.

The results reveal that ECOLOG is anchored in the development plan of the school in only 32% of the participating schools. This is surprising, because schools declare to implement ECOLOG in their school programme when joining the network. A recommendation is therefore for those schools that have not implemented ECOLOG in the school programme to do so. Nevertheless, one of the stated successes is, that ECOLOG contributed to the school development. The directly observable successes – especially at the student level – are considered a significant factor in explaining the coordinators' overall assessment of ECOLOG. Previous studies (Fleiß, 2016, 2018; Lehner, 2016; Rauch & Dulle,

2011; Ziener, 2017) made it clear that ECOLOG acts as a support system for teachers, and this survey confirms that the schools are well supported by the network.

According to model of an effective ESD-School (Verhelst et al., 2020) ECOLOG serves as a shared vision and reflects the school-wide understanding of ESD. Supportive relations provide a way of working together on ESD related issues, but could be fostered. The collective efficacy means the conviction of positive effects of teams. An essential criterion for joining ECOLOG is to build a team in the school so that ESD activities and responsibilities do not rest on the shoulders of a single person (the coordinator).

ECOLOG is the largest, steadily growing school network in Austria's environmental education field. Results of both qualitative (e.g., Ziener, 2017) and quantitative studies – such as this one – show successes and provide information on areas where further development is needed and give indications for further research within ECOLOG. In the next years, the main topic at ECOLOG refers to “society – shaping change together”. The results of this study suggest that fields of action related to this (e.g. social and economic aspects, energy and mobility) should be pushed. In subsequent studies, the teachers and students at ECOLOG schools should be included. At present, four in-depth case studies are being conducted at ECOLOG all-day schools of different school types (of which two case studies are part of the ERASMUS+ project SustainAll) (SustainAll, 2022) to investigate the relation between ESD and the all-day school concept.

AUTHORS CONTRIBUTION

Conceptualization: Franz Rauch; Methodology: Franz Rauch; Formal Analysis: Mira Dulle; Writing – Original Draft Preparation: Franz Rauch & Mira Dulle; Writing – Review & Editing: Franz Rauch & Mira Dulle.

ACKNOWLEDGMENTS

We would like to thank the following colleagues who were involved in the research project: Elisabeth Swatek, Diana Radmann, Irina Andreitz, Hanna Malhonen.

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Received: November 15, 2022

Revisions Required: March 23, 2023

Accepted: June 5, 2023

Published online: June 30, 2023

