Environmental and Sustainability education: How do we achieve transdisciplinary teaching?

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Birgitta Nordén
President CEI
Doctoral student
Malmö University
[birgitta.norden@mah.se]
Aim of the Study

The aim is to analyse and describe teachers’ experiences of transdisciplinary teaching in Education for Sustainable Development (ESD) with a global dimension.
Educational Challenge: the inherent complexity and uncertainty of sustainability issues

Teacher teams’ problems in handling the complexities of Education for Sustainable Development (ESD) is an issue linked to the concept of transdisciplinary teaching (Borg et al, 2012).

Transdisciplinary teaching is not straightforward. Apparently, it entails a risk for cognitive dissonance instead of synthesis, due to openness of different alternatives (Nikitina, 2005; Caviglia-Harris & Hatley, 2004).

It is not sufficient with an integration of subject matter from different disciplines to develop a holistic approach to sustainability knowledge formation (Yueh & Barker, 2011; Nordén & Anderberg, 2012).
Transdisciplinary Research in Society is needed

Transdisciplinary approaches of knowledge formation are processes that take place within society, not as science about society (Vikström, 2009).

Transdisciplinary research is contextualised - in whatever sphere investigated – and benefits from including individuals interacting in various fields of society (Bruun, 2005; Almers, 2009).

Research on innovative educational approaches to facilitate real transdisciplinary thinking must be prioritised, when seeking to integrate SD ideas into the curriculum (Reid & Petocz, 2006).


In-depth knowledge is needed, through complementary qualitative research with interviews on teachers’ collaborative work teaching ESD (Borg et al, 2012).
Transdisciplinary Teacher Teamwork

Transdisciplinary Education for Sustainable Development demands individual teachers working in teams to promote various methods of approaching problems, encouraging ways to find different perspectives and discourses (Feng, 2011).

The study of such educational context and teaching practice highlights how the concept of Education for Sustainable Development continuously needs to be renegotiated (Brouwer et al, 2012) by participating teachers in any concrete transdisciplinary teaching and learning situation.

A problematic linking is built into the concept of transdisciplinary teaching – takes its point of departure in the local teacher teams’ incapability to handle the complex education of SD (Borg et al, 2012).
ESD implemented at a Taiwanese High School was characterized by an elusive ‘infusion’ pedagogy i.e. unstructured opportunistic ESD content teaching.

Teacher competences of the national curriculum on ESD were not perceived.

No clash of pedagogies between some teachers advocating a framework approach of ESD as an integrative transdisciplinary whole-school enterprise, and those who conceived it as a traditional subject (Yueh & Barker, 2011).
Teachers´ Approaches to Teaching

Trigwell & Prosser (1996) suggest an identification of the underlying intentions of various teaching strategies (and motivation), and their relationship, to shed light on the meaning of and the quality in teaching approaches.

Pedagogic focus on learner, content, and teacher´s experiences at the same time is crucial for transdisciplinary knowledge formation, and understanding how the teacher works towards the intended object of learning (Marton, Runesson & Tsui; 2004).
Data Context

A Swedish upper secondary school intending to strengthen the global profile and focus on ESD heads for educational development by staging for transdisciplinary collaboration among teachers and students respectively.

The teachers have competence in twelve different subject matters, and make changes in their schedules, collaborate and discuss educational development (2010–2011). In connection with a three week project on designing a new city sector for sustainable living, small teams of pupils in two classes carry out the mission considering the various dimensions of SD.
Data Collection

Adopting a phenomenographic approach, semi-structured interview questions were used for analysing and describing the experiences of teachers concerning global teaching and learning of ESD.

Upper secondary school teachers (n=12) are working together in teams educating SD transdisciplinarily with a global dimension in a local context.

Teachers were interviewed three times (before, in the middle of, and after the pupils carrying out the specific “Sustainable City” project) approx. 45 minutes each time, in a longitudinal study during 2010-2011.
The recorded interviews were transcribed and read thoroughly, stressing the approaches in transdisciplinary teaching (TT) of GLSD.

The analysis performed used contextual analysis (Svensson, 2005) choosing and delimiting the phenomenon as a part of the world, and distinguishing its integral parts and their relations to each other.
Result: Teachers’ Transdisciplinary Teaching (TT) Approaches

APPROACH 1
Teachers *assist & take part in* TT on various levels showing differences in teacher commitment.

Protectionism, professional identity connected to the *subject matter*, and a traditional viewpoint. Still an intention to broaden the sustainability perspective so it can be seen from many different subjects.

Some teachers hope to add on to the student learning through TT by uniting subject matters with other teachers. These teachers do not want to take the lead.

APPROACH 2
Teachers who *take charge of* TT due to their personal and professional *driving force (ownership)*.
Result

TRANSDISCIPLINARY TEACHING APPROACHES OF GLSD

**Approach 1:** Subject matters (disciplines) experienced as parts (i.e. sectors) of the whole GLSD undergoing a process of a growing transdisciplinary spiral of conceptualising knowledge formation.

**Approach 2:** GLSD as transdisciplinary subject matters (in common) densify and frame a foundation for transdisciplinary teaching experienced as effective knowledge formation (potentiation).

Birgitta Nordén
Main attitudes in the teachers approaches of transdisciplinary teaching in ESD

I. CRITICAL
II. SUPPORTIVE
III. COMPLEMENTING
IV. COGENT (teachers having the power to influence or convince) & TRENCHANT (vigorous teachers, characterised by forceful and energetic action)

V. PERSUASIVE (capable of convincing; having the power to induce belief and action) & COMPREHENSIVE (teachers including all / everything – broad in scope)
Conclusions

The findings show teachers’ various experiences of transdisciplinary teaching of sustainability issues with a global dimension – in local settings.

Transdisciplinary teaching approaches of various sorts were developed e.g. surface approach and deep approach to learning (Marton & Säljö, 1976).

Teachers from different disciplines, teaching different subject matters cooperated as a professional local teaching team. Together they achieved a kind of transdisciplinarily fused teaching competence, for additional steps towards the implementation of ESD in all its complexity (Brouwer, 2012).
Further Reading


