

*Editorial*

## **Special Issue—Pedagogy for Education for Sustainability in Higher Education**

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Education for Sustainability (EfS) and Education for Sustainable Development (ESD) have been under discussion for some two decades. The UN Decade for Education for Sustainable Development 2004–2014 has provided a most important focus for ESD, and for its facilitation. However, while the Decade raised awareness of the need for ESD generally, and particularly in Higher Education, discussion of how this education can be effectively delivered to learners is still gaining momentum. This is especially the situation when considering EfS/ESD in Higher Education Institutions (HEI).

Yet HEIs have the task of preparing graduates for professional employment, where they will be expected to apply their learning. As a consequence, the connections between the relevant theories and knowledge associated with EfS/ESD and their practical applications are critical. Similarly, culture and praxis of a discipline are important as they will influence the way that the learning experiences are developed. Equally the competencies (or capabilities, skills) expected of graduates, by both the HEI and employers, will have a direct bearing on both the content of learning experiences and how they are presented to students. The role of values, and the role of the learner in assisting the goals of EfS/ESD are also considerations in the development of curriculum.

More broadly, these considerations, and many others, are critical to the development of a science of teaching and learning for EfS/ESD. While we have seen examples of discussion of the content and direction of EfS/ESD in HEIs, discussion of the pedagogy of EfS/ESD is less evident.

Hence, this special issue of *Sustainability* sought to gain some understanding of the direction of the discussion about pedagogy, an indication of what has been achieved, and where attention is required. The task was to seek contributions from scholars and practitioners whose theoretical or practical works examine issues associated with the development and delivery of curriculum, to contribute to the emerging discussion around the pedagogy for EfS/ESD in HEIs.

While the content that is included in EfS/ESD is clearly important, so too is the process by which that content is conveyed to learners. A most important component of the pedagogy associated with EfS/ESD is the process by which learners experience the material and values. This is the central theme of the contribution by Barth and Burandt [1], who emphasise the importance of learner centred

approaches. This focus on learners connects directly to the central theme of their paper, which is the development of competencies by the graduates of the programs. In the context of being the “deliverables” of a subject, competencies play a central role in the design of the subject, and consequently the mechanisms for conducting the learning exercises. The mechanism of direct interest to Barth and Burandt [1] is e-learning, orientated towards problems that a range of students work on. The authors describe the components of this approach, and importantly discuss the challenges they faced. By so doing, they provide another stepping-stone for EfS/ESD development, especially to engage a variety of students.

Identification and transference of competencies associated with EfS/ESD are also the concern for the contribution of Bertschy, Künzli and Lehmann [2]. In this case, the graduates they focus on are those who will be teachers in primary and secondary schools. The authors discuss two models and their benefit for teacher education and further education. As a result they emphasise the point that the competencies identified for a HE program should focus on profession-specific core competencies, in their case those to be used as a basis for the conception of educational offers in the field of EfS/ESD, in the education and further education of teachers. Their discussion of models serves to identify competencies, and draws them to the conclusion that, especially since EfS/ESD is not broadly recognised in teacher education, then students of this profession need subjects which could focus on development of ESD—highlighting the specific competencies of teachers.

Discussion of competencies is continued in another contribution, but this time they are associated with the professional field of environmental and civil engineering. For Bielefeldt [3] competencies that indicate understanding of EfS/ESD and the tools that are relevant to the engineering profession, are the base upon which her curriculum is based. The question then is what are good pedagogical approaches for developing these competencies? To provide a guide for others developing curriculum Bielefeldt [3] discusses experiences with approaches ranging from traditional lectures through to service-learning design projects. Her reflections about these approaches are based on the academic work of the students, their reflections and observations. These insights provide guidance, but not a solution to the implementation of EfS/ESD, as she comments “a curriculum truly designed with EfS in mind would likely require a paradigm shift in engineering” [3] (p. 4496). Importantly, Bielefeldt reminds us that people have a variety of learning styles so we would be ill-advised to seek a “one size fits all” pedagogy unless it could be supported by a lot more careful research.

A particular pedagogical approach that has been found to have merit in the education of engineers for EfS/ESD, and potentially others, has been investigated by Jollands and Parthasarathy [4]. Their focus has been the study of project based learning, and the associated use of tools, particularly concept maps. They discuss the sequential development of the student projects across years and the benefits of using concept maps, and other tools, to assess the students’ learning. Several data collection methods delivered data that indicated the value of project based learning, and its role in developing capabilities relevant to engineering roles in sustainability.

Much of the thinking about capabilities relates to those that will be relevant to graduates in the work-force, such as when teachers or engineers have graduated. These graduates are then in a position to work inside their professions to bring about change. However, a more direct approach to bring about sustainable development through transformational learning experiences is considered by Blake, Sterling and Goodson [5]. The study of the pedagogy at a civil society college has provided a review

of the college's approach and its students' learning. The results provide directions for the college itself, but the authors look at the insights more broadly. Specifically, they point to others who have proposed that transformative learning is "necessary to engender the kinds of shifts in thought and action required to meet the challenges facing our planet" [5] (p. 5367). Hence such experiences would be critical elements, if not the base, of EfS/ESD that would lead to the most effective future professionals. In this context main-stream HEI curriculum would need considerable change, and the authors discuss the challenges that would be involved. This degree of change is akin to the paradigm shift suggested by Bielefeldt [3].

As indicated by other contributions, particularly of Bertschy *et al.* [2] and of Blake *et al.* [5], the implementation of EfS/ESD curriculum takes effort, and resources. Since EfS/ESD pedagogy focuses on students and their engagement with issues and interactions outside of the class-room, an individual teacher/academic may need support to implement the curriculum. The contribution of Brundiers Wiek and Kay [6] specifically considers the need for a "transacademic interface manager" to support those participatory education efforts that are frequently an identifying feature of sustainability education and research. Their article, they say "provides practical guidance to universities on how to organize these critical endeavors more effectively" [6] (p. 4614), and intriguingly suggests that the idea of these managers can "offer students an additional career perspective" [6] (p. 4614) For those considering the potential benefits of establishing a transacademic interface manager role, or developing curriculum to develop related capabilities in graduates, Brundiers, Wiek and Kay [6] provide a rich description of the role and its development.

To this point, and generally in discussions of EfS/ESD, the discussion about pedagogy focuses on approaches aligned with the sciences or humanities. So it is encouraging that Scott [7] reminds us of the role of the arts in education and learning. In her contribution she discusses an environmental sustainability photography competition under the patronage of a non-government organisation promoting sustainability in HEIs. Examples of photos from students and HEI staff are presented and the understanding of sustainability they show is discussed. With the potential to "facilitate a shift in sustainability thinking throughout the education sector both within the curriculum and in the governance of the institutions" [7] (p. 484) such a photographic competition, or other expression of artistic understanding of sustainability, could offer expanded ways of engaging staff and students in sustainability.

In all, we have an exciting and valuable collection of insights into the pedagogy of EfS/ESD. I am grateful to the Editorial Board of *Sustainability* for enabling the collection to be assembled. Most particularly I am grateful that the contributing authors have been willing to bring our attention to the myriad ways we can expand our understanding of EfS/ESD and its pedagogy. This is critical, as it leads to better-prepared graduates of HEIs working as environment and sustainability professionals, to work on and mitigate the serious contemporary challenges to a sustainable society.

## References

1. Barth, M.; Burandt, S. Adding the "e-" to Learning for Sustainable Development: Challenges and Innovation. *Sustainability* **2013**, *5*, 2609–2622.
2. Bertschy, F.; Künzli, C.; Lehmann, M. Teachers' Competencies for the Implementation of Educational Offers in the Field of Education for Sustainable Development. *Sustainability* **2013**, *5*, 5067–5080.

3. Bielefeldt, A.R. Pedagogies to Achieve Sustainability Learning Outcomes in Civil and Environmental Engineering Students. *Sustainability* **2013**, *5*, 4479–4501.
4. Jollands, M.; Parthasarathy, R. Developing Engineering Students' Understanding of Sustainability Using Project Based Learning. *Sustainability* **2013**, *5*, 5052–5066.
5. Blake, J.; Sterling, S.; Goodson, I. Transformative Learning for a Sustainable Future: An Exploration of Pedagogies for Change at an Alternative College. *Sustainability* **2013**, *5*, 5347–5372.
6. Brundiers, K.; Wiek, A.; Kay, B. The Role of Transacademic Interface Managers in Transformational Sustainability Research and Education. *Sustainability* **2013**, *5*, 4614–4636.
7. Scott, R. Education for Sustainability through a Photography Competition. *Sustainability* **2014**, *6*, 474–486.

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