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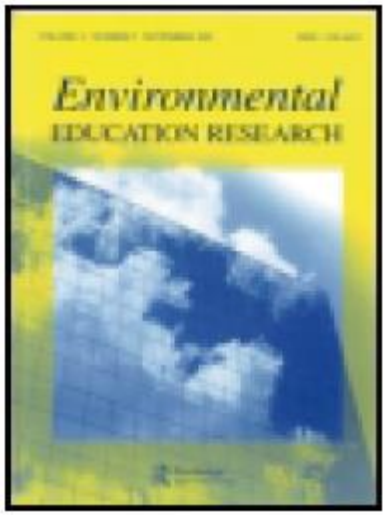

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Seeking sustainability competence and capability in the ESD and HESD literature: an international philosophical hermeneutic analysis

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Abstract

Education for sustainable development (ESD) and higher education for sustainable development (HESD) are complex, multidisciplinary fields of enquiry, drawing on

concepts and terms from different disciplines and languages. Although the fields are advancing in their acceptability within educational systems worldwide, they are currently struggling to achieve sought-after graduate and societal outcomes such as environmentally-responsible or sustainability-focussed-citizenship. The research described in this article explores the possibility that miscommunication or misunderstanding of basic concepts within these fields is contributing to slow progress towards their objectives. We used a philosophical hermeneutic analysis to explore how the terms 'competence' and 'capability' are used within selected ESD/HESD papers. We identify substantial internal contradictions and inconsistencies with respect to differences between learners' abilities and their willingness to perform these abilities, and to the educational context in which these outcomes are sought. We emphasise the importance of linking educational objectives with pedagogical approaches to teaching and assessment.

Keywords: ESD literature, philosophical hermeneutic analysis, sustainability competence, sustainability capability, pedagogy, assurance of learning

100 word summary (required for EER submission)

Three professors from different parts of the world and with different ideas about education for sustainable development (ESD) met regularly by videoconferencing to undertake a philosophical-hermeneutic analysis to explore how the widely-used terms 'competence' and 'capability' are used within the ESD literature. They identified inconsistencies in how these terms relate to learners' abilities and to learners' willingness to perform these abilities, and to the educational context in which these outcomes are sought. Authors emphasise the importance of linking desirable educational objectives to the pedagogical approaches used to teach and assess them.

Introduction

Many hundreds of higher education institutions (HEIs) worldwide have signed the Talloires Declaration agreeing to, amongst other things, 'Educate for Environmentally Responsible Citizenship' (see for example Sylvestre et al. 2013) as well as many other declarations about higher education for sustainable development (Michelsen 2016). These commitments have much in common with international agreements relating to sustainable development including, for example, Agenda 21, which suggested that education "*is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision- making*." (United Nations Sustainable Development 1992, chapter 32). The critical role of education has been reconfirmed recently in the formulation of the Sustainable Development Goals (SDGs) (Griggs et al. 2013; UNESCO 2017) and the Global Action Programme on Education for Sustainable Development (UNESCO 2014). Recent commentaries, however, suggest that HEIs and those who teach

within them do not necessarily agree on what is supposed to be incorporated within this form of education (Shephard and Furnari 2013) and are not necessarily making substantial progress towards graduate and societal outcomes such as environmentally responsible citizenship (Ryan and Tilbury 2013; Barth 2015; Cotton and Alcock 2013) or sustainability citizenship (Barry 2005; Wals 2015; Wals and Lenglet 2016).

The research described in this article focuses on the possibility that miscommunication or misunderstanding of concepts within this field of enquiry is contributing to slow progress towards the objectives of HESD (higher education for sustainable development) and ESD (education for sustainable development) combined here as ESD, but noting that our primary interest is higher education. Shephard and Brown (2017), for example, explored the possibility that conceptual stretching (Sartori 1970) of the term 'democracy' and its resulting confused status within the ESD discourse has been a contributory factor slowing progress towards a 'democratic' higher-education sustainability strategy. Inherent to this analysis was a consideration of the nature of ESD as a multidisciplinary project. The discipline of education, with its intrinsic terminology and ways of understanding, finds itself in juxtaposition with a range of social science and science disciplines in the context of sustainability. It is perhaps inevitable that disciplinary concepts such as pedagogy, learning outcome, competence and capability provide a challenge for those involved in this multidisciplinary discourse to understand and use as part of this discourse. Added to this, ESD is an international movement and draws in concepts that derive from different parts of the world and different languages (Barth and Michelsen 2013). German words such as *Gestaltungskompetenz* (shaping competence, de Haan 2006; Barth et al. 2007) and *Bildung* (emancipatory education, Biesta 2002) are now part of the ESD vernacular (de Haan 2010)[1]. Although our rich vocabulary may help us to explore and develop our discourse, participants in this field of enquiry do need to reflect on whether or not we have sufficiently common understandings of contributory concepts to enable us to share ideas within our communications.

In this article we focus on the concepts, in English, of competence and capability. Both terms are widely used within ESD discourse, in particular in relation to the learning that occurs as a result of education (Rieckmann 2012, 2018; Sterling and Thomas 2006; Sterling et al. 2017; Wiek et al. 2011, 2016). As such they are fundamental to the education missions of ESD and crucial to our interdisciplinary and multi-language engagement. They are also at the centre of an ESD debate on the purposes and functioning of education with respect to sustainability that has dominated this field of enquiry for several decades (see for example, Wals, 2010a).

[1] *Bildung* is an idea in the European continental education tradition, which translates only poorly in English. It distinguishes a more instrumental training-oriented education from a concept of education that focuses on emancipatory processes of Self-*Bildung*. *Gestaltungskompetenz* is a widely used concept of key competencies that elaborate learning objectives of *Bildung* in ESD.

Several researchers have conducted relevant literature reviews, analysing and (re-) structuring the international academic discourse on sustainability competencies. Based on a review of the international ESD literature, Wiek et al. (2011) distinguish five sustainability key competencies: systems thinking, anticipatory (or future) thinking, normative (or values) thinking, strategic (or action-oriented) thinking, and interpersonal (or collaboration) competencies. Recently, they have added a sixth competency: integrated problem-solving competency, which is described as a "*meta-competence of meaningfully using and integrating the five key competencies for solving sustainability problems and fostering sustainable development*" (Wiek et al., 2016, 243). Using hermeneutics and grounded theory, Lozano et al. (2017) also analyse the international ESD literature, resulting in a synthesis of twelve competencies: systems thinking; interdisciplinary work; anticipatory thinking; justice, responsibility, and ethics; critical thinking and analysis; interpersonal relations and collaboration; empathy and change of perspective; communication and use of media; strategic action; personal involvement; assessment and evaluation; and tolerance for ambiguity and uncertainty. They also address the question of which pedagogical approaches are needed for developing these competencies, e.g. project- or problem-based learning and community service learning, relating the competencies and the pedagogical approaches to each other. Notably, questions about how intended outcomes are to be assessed are generally not included in these reviews, but left as a future research agenda (see Wiek et al. 2016, for example). Another literature review by Sterling et al. (2017) has analysed the ways in which sustainability competencies have been identified and discussed, and specifically how they are presented for the range of educational sectors and disciplines. The results of this systematic literature review show that different terms such as skills, literacy, competencies, or capabilities are used in the international literature on ESD learning outcomes, "*although they often mean similar things*" (Sterling et al. 2017, 163). The authors conclude; "*terminological clarification is needed*" (Sterling et al. 2017, 163). Wiek et al. (2011) and Lozano et al. (2017) describe the common ground of different contributions to the ESD competence discourse. Sterling et al. (2017) emphasise the existing confusion and call for more scientific accuracy.

Against the backdrop of these international literature reviews, and particularly following the argument of Sterling et al. (2017), the research described in this article used a different research approach to explore in how the terms 'competence' and 'capability' are used within selected ESD/HESD papers and how they relate to explicit, or implicit, expressions of the pedagogy suggested for their teaching, learning and assessment; making visible the contradictions inherent to the ESD discourse.

All three authors of this article themselves are actively engaged in the ESD competence discourse (Barth 2015; Barth et al. 2007; Rieckmann 2012, 2018; Shephard 2016), and express commitment for higher education to contribute to sustainable development but also concern that the complexity of usage of the terms 'competence' and 'capability' may detract from their usefulness in ESD

communication, particularly with respect to often assumed, rather than specified, links to the pedagogical approaches used to achieve these competencies and capabilities. All three undertake research internationally, but for this project, leveraged to advantage their different language (English, German) and national backgrounds (Germany, England / New Zealand) and their varied interests in these terms to better understand how they are being used in the broad and international ESD literature.

The three authors regularly met, using videoconferencing, throughout much of one year. Their meetings allowed them to: iteratively and progressively formulate their research question; agree on what texts to engage with, and to argue about, to address their research question; and how to resolve the questions that this engagement led to. This research article describes how these three researchers used philosophical hermeneutics to resolve their different interpretations and came to reach a common understanding of these differences. The article starts by describing the nature of philosophical hermeneutics. It proceeds to describe how we developed our research question, the processes that we undertook to address this question and the answers that we discovered. We discuss our interpretations with respect to the needs of ESD and end with some broad recommendations for those who research in this field of enquiry.

Methods

Philosophical hermeneutics (as described by Gadamer 2004) is both a philosophical method and a research approach designed to aid interpretation of difficult and complex issues; particularly where different interpretations of the same articulations are likely and conflicting. Whereas traditional hermeneutics is a form of text analysis and has been used extensively in the discipline of theology to uncover the original meaning of text that has become obscured over time, philosophical hermeneutics is used far more broadly as an approach that addresses how text and other communications are interpreted, and what influences this interpretation, and it was the research approach adopted in this project. Other approaches and methodologies could, no doubt, be used to address questions relating to competence, capability and learning in ESD, but philosophical hermeneutics may be unique in its ability to contribute simultaneously to understanding in a field of enquiry and to the development of the researchers. Research approaches within philosophical hermeneutics are described in full by Gadamer (2004) and in the context of ESD by Shephard and Brown (2017). There are two fundamental aspects of philosophical hermeneutic enquiry that underpin our work. The first is an interpretation of text analysis that relates reading a text to having a conversation with it, so as to reach an understanding. Gadamer (2004) suggests: "*Conversation is a process of coming to an understanding. Thus it belongs to every true conversation that each person opens himself to the other, truly accepts his point of view as valid and transposes himself into the other to such an extent that he understands not the particular individual but what he says. What is to be grasped is the substantive rightness of his opinion, so that we can be at one with each other on the subject*." (403). The second describes the inevitability of interpretation being the

product of productive or unproductive prejudices. "*The prejudices and fore-meanings that occupy the interpreter's consciousness are not at his free disposal. He cannot separate in advance the productive prejudices that enable understanding from the prejudices that hinder it and lead to misunderstanding*." (295). Our task was to converse with text within or related to ESD, in the context of competence and capability, and to use our different experiences, and prejudices, to advantage, to reach if possible a collective understanding.

Our early discussions identified our interests in three broad, and initially poorly defined, facets of ESD involving competence and capability: the nature of the learning identified by ESD practitioners; the extent to which this learning is expected to contribute to learners' future behaviours (or dispositions to behave in particular ways); and links between expressions of competence, or capability, as learning objectives, and the pedagogical approaches designed to achieve them. We also, at an early stage, adopted a comprehensive conception of pedagogy to include planning learning, facilitating learning, assessing and evaluating learning, scholarship, and leading change. We were in particular mindful to understand how models of learning articulated not only the nature of the learning involved, but also the processes used by teachers to assure themselves that learning occurred.

After some development we eventually formulated our research question as: *How do particular conceptions of ESD- and sustainability-competencies, described in selected research articles, relate to explicit, or implicit, expressions of the pedagogy suggested for their teaching, and learning?* We applied our research question sequentially to individual research articles that collectively we identified as relevant to our task and as described in detail in the next section. In general terms, the articles that we chose to include in this research were those that we thought particularly meaningful to ESD in the context of our research question.

As a general procedure, having collectively chosen an article to read, we did so individually, noting our individual understanding and concerns. We compared our notes verbally during our videoconference meetings and shared where our points of view differed, a process that resulted in questions that each of us returned with to the text to ask. Often, we each had different questions for the text. As our questions were resolved we shared our often-nuanced new understanding by email and in the subsequent videoconference meeting. Although we recorded most of our conversations, we also kept and shared notes from each meeting. It is important to note that in this article we refer to conversations with texts, not with authors. No doubt conversations with the authors would have been quite different.

Texts and Results

We initially approached Wiek et al. (2011) as one article that attempts to comprehensively address the nature of sustainability competencies in ESD and that is recognised as an important paper in the discourse on ESD and sustainability competencies (Lozano et al. 2017). Wiek et al. (2011) *"… identifies the relevant*

literature on key competencies in sustainability; synthesizes the substantive contributions in a coherent framework of sustainability research and problem-solving competence; and addresses critical gaps in the conceptualization of key competencies in sustainability." (203). Our conversations with Wiek et al. (2011) confirmed our ability as individuals to interpret text differently. Wiek et al. (2011) describe a range of competencies in detail; including for example, normative competencies, justified by *"The concept of sustainability is unavoidably value laden and normative, since it addresses the question of how social- ecological systems ought to be developed, so that they balance and even enhance socio-economic activities and environmental capacities..."* (209). We were not initially in agreement about the categories of learners for whom these competencies were key, nor in agreement about the nature of the teaching and learning suggested by the article as likely to lead to these key competencies. We were, for example, individually and differently confused by terms such as 'convey', as a pedagogical device (as in *"Basic capacities in critical thinking, communication, pluralistic thinking, research, data management, and so forth ought to be conveyed in every quality academic program—and thus serve as the foundation of academic sustainability education."* Wiek et al. 2011, 211) in relation to the complexity of the learning tasks intended. We wondered, for example, if teachers really 'convey' critical thinking to their students?

We decided to consult next de Haan (2010), representing German traditions in ESD that have contributed to ESD developments internationally (Barth et al. 2007; Lozano et al. 2017), to clarify possible misconceptions within our conversations, particularly with respect to the meaning of *Gestaltungskompetenz* and *Bildung* and the implications of these meanings to pedagogical approaches that might be compatible with these meanings. We noted that de Haan (2010) is situated within the context of compulsory (school) education, whereas other articles included were primarily situated within higher education. De Haan (2010) *"… provides a Model of Competence for ESD in the formal education sector. This model aims to inform the organisation of teaching and to help assess the learning outcomes of pupils who have received instruction in issues relating to ESD*." (315) Our conversations with and about de Haan (2010) suggested that each of us interpreted the article's main points in broadly similar ways, but that all three of us expressed concerns about some of the article's assertions. Much consternation focused on the term *Gestaltungskompetenz*, defined by de Haan (2010) as "*the specific capacity to act and solve problems*" (320). We linked our concerns to de Haan's description of the 'situated learning' paradigm, that in de Haan's words included self-direction and active participation of the learner ("*Situated learning is application-related, world-oriented and self-directed. It implies the active participation of the learner. The latest research on learning favours self-directed processes: self-guidance in the learning process results in more successful learning*." 319). We wondered how the model simultaneously combines self-direction, active participation and successful attainment of *Gestaltungskompetenz* and noted that de Haan (2010) left it to the final paragraph to explain that some facets of the model were measurable, while others were not. *"One might argue that the empirical foundation only covers the measurable outputs of ESD - and ESD undeniably has many other, less measurable*

facets, including attitudes, affects, attitude-based actions, and so on. I agree with these objections and would like to address them here with a quote that has been attributed to Albert Einstein: "Not everything that counts is measurable"." (326) As hermeneutic- conversationalists with this article, we were left in some doubt. If the model of competence cannot be tested empirically, perhaps we are simply to trust in its efficacy and good intentions?

Next we consulted Wals (2010b) as an identified "*exemplary autobiographical empirical case study*" (380) that addresses competencies in an ESD setting. Our conversations with Wals (2010b) resulted in substantially different interpretations within our group, particularly about the nature of the learning outcomes that could or should be sought in higher education. Wals (2010b)'s purpose was to *"… to identify components and educational design principles for strengthening sustainability competence in and through higher education. …. from a transformative social learning perspective."* (380) A significant element of the paper compares the educational design described in this case study with that of the kindergarten. As hermeneutic researchers, we all disagreed with Wals (2010b) that a comparison with learning in the kindergarten (as described by Fulghum 1986) was useful, in particular as we thought that the nature of learning in the kindergarten described by Fulghum (1986), although clearly transformative, was far from self-directed. We also doubted that transformation was proven, and one German-speaking researcher was concerned about how German words *Gestaltungskompetenz* (based on "gestalten" as to actively shape or design) and *Gestalt* (as the appearance of something or someone) had evolved into a new concept of gestaltswitching in the context of multiple competencies.

To help us resolve our concerns and differences, we conversed with Lozano et al. (2012) as these authors had attempted their own critical analysis of the concept of 'competence' in higher education, from a 'capabilities' perspective. Lozano et al. (2012) " *… first, make a critical analysis of the concept of competence as it is being used in higher education, identifying its limitations and weaknesses; and second, present the potential of the capabilities approach for higher education and review its complementarity to the competence approach." (132)* Our conversations with Lozano et al. (2012) identified great differences in how we, and these authors, use these terms. Our differences focused on the extent of learners' free choice in reaching an outcome and the idea that sustainability competencies, and *Gestaltungskompetenz*, implicitly incorporate willingness to do or be something, alongside ability. Learners' free choice was for all of us limited in educational models that incorporate willingness to behave in a particular way within an intended, or obligatory, outcome. Above all else, the educational idea of Lozano et al. (2012)'s capability emphasises freedom of individuals to choose. " *… the focus here is not on the results that a person achieves but on the fact of being able to opt for an action, choice or behaviour. The emphasis on capabilities involves understanding well-being as the freedom to choose some functionings rather than others. Because of this, the capabilities approach is much broader and more holistic than the competences approach; while the competences approach focuses on solving specific problems*

oriented to specific demands, the capabilities approach considers how the individual in his or her context can lead a life that she or he has reasons to value." (139). A core aspect of the Lozano et al. article, and associated lines of enquiry, relate to possible dissatisfaction with an assumed instrumental characteristic of competencies (with implicit similarities to one culture 'developing' another, and using 'evaluation' to determine how effectively such development has occurred). Lozano et al. (2012) caused great consternation within our group. In particular, two researchers identified that some of the characteristic freedoms ascribed to capabilities by Lozano et al. (2012) should also be credited to competencies, as they knew them, and perhaps that an issue central to this problem related to misinterpretation or ignorance of the German concepts of *Überwältigungsverbot*[2], *Bildung* and *Gestaltungskompetenz*. In particular both identified characteristics of free choice and learners' self-determination as characteristic of how they understood competence in the ESD literature.

Lozano et al. (2012) did, however, encourage us to formulate some clear questions that each of us would take back to each of Wiek et al. (2011), de Haan (2010) and Wals (2010b).

- We thought it possible that implicit within some conceptualisations of sustainability competence was a direct comparison with democracy and honesty. In this way of thinking, teaching students at any level to be sustainable was no less acceptable than teaching them to be democratic or honest. Such instruction does not carry with it concerns about overwhelming learners (or indoctrination) because it is culturally unacceptable to be anything other than honest, democratic and sustainable. From this perspective, sustainability, like democracy and honesty, are not to be the product of learner self-determination, but students' decisions within the concept of sustainability (such as how to achieve it) may be the product of learner self-determination. What does each article say about the learner's journey?
- We thought it possible that, however authors conceptualised terms such as competence and capability, they fundamentally agreed with the capability approach as defined by Lozano et al. (2012) with a focus *not on the results that a person achieves but on the fact of having the freedom to opt for an*

[2] *Überwältigungsverbot* (which could be translated as 'overwhelming ban', meaning that students should not be overwhelmed or indoctrinated) in the German discourse on civic education is widely accepted to mean that (school) education should not manipulate learners, not force them to think or behave in a particular way or to adopt specific values. Therefore, de Haan and others state that *Gestaltungskompetenz* should be developed, but it has to be a self-directed learning process, and if students are assessed, only their abilities should be assessed, not their willingness, values,…, because a teacher should not decide what the students should think or how they should behave.

action, choice or behaviour. Is this 'essential freedom' what the models proposed were designed to achieve? What does each article say about the learner's destination?

- We thought it inevitable that whether the term 'competence' or 'capability' is used to describe an outcome based on freedom of choice, a particular conceptualisation of pedagogy would be necessary to achieve it, and to assure its achievement. It seemed to us unlikely that conventional lectures and examinations would achieve the fact of having the freedom to opt for an action, choice or behaviour. What does each article say about pedagogical design and assessment?

Surprisingly, returning to Wiek et al. (2011), de Haan (2010) and Wals (2010b), with three formally constructed questions, resulted in considerable agreement within our research group and some clarity about where our understanding differed (see Table 1, 2 and 3, columns 2, 3 and 4). Overall, we three agreed that there are substantial internal contradictions in all three papers relating to a desire to support learning in an open and enquiring manner, respectful of the essential freedom that all would wish to afford to learners, and the requirements of specifying, in relatively precise terms, the knowledge, skills and attitudes that learners should acquire. These internal contradictions manifested themselves as inconsistencies between intended outcomes and the nature of learner support and, where described, assessment and/or evaluation of outcomes.

Our conversations with Wiek et al. (2011) suggest that this article, while extending confusing or contradictory messages about pedagogy, was at its heart identifying cognitive and affective outcomes for a programme designed for sustainability professionals. Most professions agree a set of values that underpin actions within the profession, that are taught alongside professional education, and sustainability professionals are likely no different. Learners within a profession may not expect to be granted the essential freedoms that other educational programmes are expected to provide and should expect overt values-education, with respect to the agreed values of the profession. Implicit within this argument is the fact that the model of outcomes proposed by Wiek et al. (2011) may not be suitable for learners who have not given up their essential freedoms to join the sustainability profession.

Our analysis is more complex for the model proposed by de Haan (2010). In this model, sustainability outcomes are similarly precisely prearranged and they implicitly (or in some cases explicitly) incorporate values (such as learners being willing to do or to be what the intended outcomes prescribe) but present confusing messages about the extent of learners' free choices on their learning journey. For us, the model describes a values-education, but with some parts missing. In particular the model identifies that some important outcomes, those that relate to the values that learners acquire, are not measurable and so rely on indirect measures, such as student opinions about what they have learnt. We note that this particular model relates to compulsory education rather than to higher education, so that its context

Table 1. Articles' responses to Question1.

Question	Weik et al. 2011	De Haan 2010	Wals 2010b	Mogensen and Schnack (2010)	Sterling and Thomas (2006)
1 We thought it possible that implicit within some conceptualisations of sustainability competency was a direct comparison with democracy and honesty. In this way of thinking, teaching students at any level to be sustainable was no less acceptable than teaching them to be democratic or honest. Such instruction does not carry with it concerns about "Überwältigungsverbot" (or indoctrination) because it is culturally unacceptable to be anything other than honest, democratic and sustainable. From this perspective, sustainability, like democracy and honesty, are not to be the product of learner self-determination, but students' decisions within the concept of sustainability (such as how to achieve it) may be the product of learner self-determination. Is this concept implicit or explicit within this article? What does each article say about the learner's journey?	This article does not emphasise learner self-determination at any level. Rather the text emphasises "*an ambitious knowledge and skills profile*" for students (204) … "*to enable successful task performance and problem-solving" (204)*, and a set of skills "*tailored to address key issues of sustainability including socio- ecological systems integrity, intra- and inter-generational equity*" (209). It is clear that although this is an attempt to enable formal education to define exactly in which ways learners will deal with sustainability, it needs to be noted that the students involved are likely to be 'sustainability-specialists'. Perhaps in this context, learner self-determination occurs prior to them embarking on this particular programme.	De Haan 2010 specifies that learning is to be "*self-directed and involve the active participation of the learner.*" (319) but our conversations with the article *suggests a meaning for* gestaltungskompetenz that involves both ability and willingness to achieve the described sub-competencies. Teaching students to be willing to e.g. " … *show empathy for and solidarity with the disadvantaged*". and "… *participate in collective decision making processes.*" (323) is not clearly emphasising self-direction either in the journey or in the destination. With respect to learner's journey, the text is potentially internally contradictory. It needs to be noted that the learners described by De Haan (2010) are in compulsory education, where, internationally, learner self-determination may be viewed as less critical than in some forms of higher education.	Wals (2010b) specifies that learning processes and environments in higher education should be *"authentic, inspiring and driven by existential issues"* (382) … but the transformation attempted here, and described by comparison with the kintergarden (quoting Fulghum, 1986) has limited opportunities for self-determination. For example, there is not a direct determination of specific behaviour suggested here, but somehow it is intended that students will not like 'happy meals' in future. Fulghum (1986) has a particular insight into how values are taught in kindergarten. *"Once we are told about these things, we soon discover we are taking a lab course. We are going to be asked to practice these precepts every day. Knowledge is meaningful only if it is reflected in actions"* (5).	Our engagement with this article needed to address its insistence that action-competence (AC) is not a competence. " *Through the spectacles of action competence, you may look for and ask for and measure different (key) competencies, but action competence will not be one of them.* " (67). In some senses, our question is only relevant to particular and defined manifestations of AC. In general, there is a strong encouragement that any AC approach should be based in learner self-determination but a somewhat circular argument that learners should self-determine precisely what others determine for them. " … *a central element of the approach is to be critical of moralistic tendencies, preconceived ideas and hidden agendas when working with environmental education, health education, ESD or other teaching–learning sequences that deal with societal issues involving conflicting interests. Rather, the action competence approach points to democratic, participatory and action-oriented teaching–learning that can help students develop their ability, motivation and desire to play an active role in finding democratic solutions to problems and issues connected to sustainable development that may even consist of the aforementioned tendencies, ideas and agendas.*" (62)	This article does not emphasise learner self-determination at any level. " … *We need to produce 'sustainability literate' students, able to contribute to the changes required for a low carbon economy and a society which is low in the use of energy and raw materials and high in terms of intellectual capital, creativity, and capacity for collaborative working.*" (6), " … *students operate as critically reflective practitioners of sustainable development*" (17).

Table 2. Our articles' responses to Question 2.

Question	Weik et al. 2011	De Haan 2010	Wals 2010b	Mogensen and Schnack (2010)	Sterling and Thomas (2006)
2 We thought it possible that, however authors conceptualised terms such as competence and capability, they fundamentally agreed with the capability approach as defined by Lozano et al (2012) with a focus not on the results that a person achieves but on the fact of having the freedom to opt for an action, choice or behaviour. Is this 'essential freedom' what the models proposed were designed to achieve? What does each article say about the learner's destination?	This model is clearly aimed at the results the person achieves, rather than on the fact of being able to opt for an action, choice or behaviour. There are no essential freedoms implied or described here. *"For these new sustainability programs, key competences are a critical reference point for developing the ambitious knowledge and skill profile of students expected to be future "problem solvers", "change agents" and "transition managers""*(204)	In defining a complex and possibly complete set of sub-competencies for gestaltungskompetenz, itself meaning to have the *"the skills, competencies and knowledge to change the economic, ecological and social behaviour without these changes merely been a reaction to existing problems."* (320); and within a model of competence that *"aims to inform the organisation of teaching to help assess the learning outcomes of pupils who have received instruction in issues relating to ESD"* (315); what is proposed by De Haan (2010) could not reasonably be interpreted as leading to the essential freedoms described by Lozano et al (2012). This model is clearly aimed at the results that the person achieves, rather than on the fact of being able to opt for an action, choice or behaviour.	We agreed that in both the kindergarten and the course described by Wals (2010b), the pedagogy described or implied emphasises the experiential nature of learning. But, and while we might understand the nature of the outcome sought in the kindergarten, we could not discern, or agree, what outcome was sought by Wals (2010b) or whether learners achieved it.	The Action-competence approach specifically denies the learner the fact of being able to opt for an action, choice or behaviour. *"… one key role for ESD in an action competence approach becomes that of developing the students' ability, motivation and desire to play an active role in finding democratic solutions to problems and issues connected to sustainable development."* (68)	There are some contradictory elements here. As well as stating quite specifically what students need to have ("*Students need to have: commitment to social justice, equity, and social responsibility; value and respect for diversity and; concern for the environment and commitment to sustainable development.*" (15); the authors *"would further emphasise the importance of developing the ability and confidence [of] students to think for themselves"* (10). There is little in this article to suggest that the educational approaches used here are to create essential freedoms.

Table 3. Our articles' responses to Question 3.

Question	Weik et al. 2011	De Haan 2011	Wals 2010b	Mogensen and Schnack (2010)	Sterling and Thomas (2006)
3 We thought it inevitable that whether the term competency or capability is used to describe an outcome based on freedom of choice, a particular conceptualisation of pedagogy would be necessary to achieve it, and to assure its achievement. It seemed to us unlikely that conventional lectures and examinations would achieve the fact of having the freedom to opt for an action choice or behaviour. What does each article say about pedagogical design and assessment?	Although the article is about competencies as the product of pedagogy, rather than promoting particular pedagogical approaches, it is possible to discern in the text (and in Table 2 in particular) some links to teaching and learning activities (TLAs) and teaching approaches, and a discussion on promotion of an ideology. The issues are not resolved in the article, but overall our conversations with Weik et al 2011 suggest that this model makes use of some teaching and learning approaches (such as " *creating and crafting sustainability visions*" (205) and explanatory rhetoric, described by Lozano et al as essentially capability-related; but others (such as *"convey critical thinking capacity"*, 211) and the intended outcomes described relate more to what Lozano et al describe as a competency-based approach. With respect to pedagogy, the text is essentially internally contradictory.	On TLAs; this model does specify levels of participation and dialogue emphasised by Lozano et al (2012) as central to the capability approach. … *"Situated learning is application-related, world-oriented and self-directed. It implies the active participation of the learner. The latest research on learning favours self-directed processes: self-guidance in the learning process results in more successful learning."* (319). On assessment and evaluation; the paper does emphasise clear, previously stipulated and relatively unambiguous intended outcomes, described as competencies, that in the described pilot study (BLK 21) were confirmed by an evaluation based on students' own feedback, rather than measurement. Accordingly, with respect to pedagogy, the model is essentially incomplete and requires educators, and society, to trust learners' own estimates of their educational achievement.	On TLAs; this model clearly does specify levels of participation and dialogue emphasised by Lozano as central to the capability approach. Activities are essentially social and *"The activity did not stop at raising awareness and developing knowledge and understanding of real world issues, but, as the students redesign the happy meal, also creates opportunities for self-determined changes and actions."* (385). On assessment and evaluation; the paper does specify what was assessed or how. The text states that a meaningful transformation generally does occur but does not specify the nature of 'meaningful'. *" The whole activity is transformative in that the learners' views of fast food in general and of a happy meal in particular change in a meaningful way as is shown by students' responses to examination questions and course evaluations." (384).* We do wonder if a student's response in this assessment emphasised that the student had chosen to opt for an unsustainable action (for example, liking the happy meal just as it is) whether the author would have found the response similarly meaningful.	This article says more about what is not AC relevant pedagogy, than what is. It does, however, provide quite precise commentary on how to evaluate the attainment of outcomes. "*From an evaluation perspective, the action competence approach calls particular attention to self-evaluation, "(69) . . . . and " … the participants in the education process themselves must be given the opportunity to discuss and contribute to the development of their own set of indicators that, according to them, promote good ESD.*" (69)	Although the article claims not to be about the *"pedagogical options"* (3), these being "*beyond the scope of this paper*" (4) there are many clues to the authors' ideas about pedagogy For example, "*The perspective here is not a list of sustainability concepts that might be added on to an existing curriculum, but a significant reconfiguration of educational purpose and approach. The focus is on ethical engagement, the processes of critical analysis, and the use of holistic approaches.*" (5). On assessment Sterling and Thomas (2006) say little. "*Whilst some see sustainability as implying a major challenge for the purposes and nature of university education as a whole, it is still necessary to indicate curriculum ideas that any HEI can begin to implement, ideally as a precursor to deeper change.*" (1). Theirs was an initial exploration of ESD, absolving them from the responsibility of imagining a complete pedagogical model to include how learning would be assessed or evaluated.

is relevant to its application, but the data in Tables 1,2 and 3 identify for us similar inconsistencies in Wals (2010b) in the context of higher education, and particularly with respect to assessment of transformation. We agreed that in this ESD discourse 'competence' and 'capability' were used in diverse and confusing ways; in particular in relation to the acquisition of values by learners.

Encouraged by our developing common understanding and common frustration about miscommunication within these articles, we committed to using our three questions with two additional articles, aiming for some degree of thematic saturation in our exploration. We conversed with Mogensen and Schnack (2010), as the authority on the widely used concept of action-competence, to ask if we shared an understanding of what it is. And we turned to a much earlier article by Sterling and Thomas (2006), in history-sleuth-mode, to determine how, since then, the fields of enquiry known as ESD, HESD and Education for Sustainability could possibly have developed in such an internally-contradictory manner. By this stage, researchers knew each other's minds very well and we found it easy to identify where our individual conversations with each text resulted in common understanding (see Table 1, 2 and 3, columns 5 and 6). Clearly, although Mogensen and Schnack (2010) is about action-competence, it is not necessarily about competence, capability or indeed action, although any of these may be involved in the approach described. In essence, Mogensen and Schnack (2010) describe an approach committed to something that both learner and teacher co-determine, which may or may not align with prior notions of sustainability. As with de Haan (2010) readers are left until the final page for enlightenment; in this case discovering that Mogensen and Schnack (2010) is more about a rediscovery of the value of critical thinking, than an exploration of sustainability competence. "*The language of possibility underlines that the critical thinker does not look for limits and restrictions, but searches for and is inspired by ways that have been successful and fruitful for other cultures, in other periods of time, and in other situations, in a creative and open- minded way."* (70). We also found it easy to agree on what Sterling and Thomas (2006) contribute to this discourse. These authors, in 2006, clearly did not distinguish between competence, capability, ability and learning outcome. All are sought, and interchangeable in this article. The article *"... suggest some indicative schemas that might help academics design curricula for ESD. Further, a model of staged learning and change linking institutional change with deepening student experience is suggested..."* (1) but neither attempts nor addresses the challenges of assessing or evaluating the learning that might result from such institutional change and deepening student experience.

Discussion

We started with a concern that miscommunication or misunderstanding of basic concepts within ESD is contributing to slow progress towards its objectives and we focused on the competencies and capabilities often identified as learning outcomes. Our hermeneutic analysis progressively focused on substantial internal contradictions and inconsistencies in the ESD/HESD literature that independently and collectively our conversations with chosen texts elicited. In particular there is

clearly no consensus in this literature that relates intended outcomes, processes to support learning, and where described, methods to assure learning. Our analysis highlighted the diverse and confusing ways that 'competence' and 'capability' are used and how texts describe or assume the acquisition of sustainability values by learners, rather than monitor, measure or research them. In turn, our analysis reemphasises the educational question that whether to be competent, or capable, to do something, one also needs to be willing to do it. Diverse manifestations of this question have a long history. Vare and Scott (2007) sought to distinguish two forms of ESD (1and 2) substantially on the basis of learner-independence. Moving forward Shephard et al. (2017) question the extent to which learners in higher education are empowered to be independent and Biberhofer et al. (2018, 10) seek to specifically differentiate competence development from motivation change: *"In contrast to competencies, which can be directly developed by educational institutions, motivation – nested in worldviews and values – should be developed and reflected upon but educational processes should not aim at directly moving motivation in a certain direction."* Our research suggests that ESD in the years since 2007 has all too often failed to specifically combine concerns for competence-based learning outcomes, pedagogical approaches to achieve them and assessments to assure their learning.

Turning to dictionaries in English (The Oxford English Dictionary) and German (Bibliographisches Institut 2015), it can be seen that in both languages, competent/*kompetent* has multiple and overlapping meanings, but has developed with a clear conceptual separation between competence as ability and as the performance of that ability. Why then had this conceptual separation failed to emerge in the ESD/HESD literature? Clearly language evolves, and words in common usage acquire technical specificity in disciplinary contexts. But it seems odd to us that in ESD/HESD, competent/*kompetent* would acquire a meaning specifically disproved of in common usage.

We were also aware that in our own hermeneutic journey of nearly a year, our own understandings of these matters had evolved. One of us stated that, in exploring Sterling and Thomas (2006), his 2016 interpretation of the text was very different from what it would have been had he read it in 2006. We thought that at least part of our personal development of understanding was associated with our own engagement with what Meyer and Land (2005) identify as troublesome knowledge. Once one understands particular types of knowledge in particular ways, it is difficult to return to a time when one didn't. We also became aware that these concepts themselves evolve with time, even within the minds of those who first imagined them. Mogensen and Schnack (2010) took a long article to describe what action competence was and was not in 2010, emphasising that it was not, in fact, a competence amongst others to be taught without regard to the free will of learners. But back in 1997, action competence was clearly built on a form of competence that involved being willing to be something in particular *"'Competence' is associated with being able, and willing, to be a qualified participant"* (Jensen and Schnack 1997, 165).

There is nothing inherently wrong with complex meanings that evolve with time; this is the nature of language. But there comes a point when words no longer communicate meaning and can hinder fruitful engagement. The political scientist Sartori identifies in comparative politics a process of conceptual stretching. Sartori (1970) used a range of terms related to democracy to explore how they had been conceptually stretched and concluded that "*Intolerably blunted conceptual tools are conducive, on the one hand, to wasteful if not misleading research, and, on the other hand, to a meaningless togetherness based on pseudo-equivalences*" (1053). Our own hermeneutic exploration casts doubts on the contemporary usefulness of 'competence' and 'capability' and suggests to us that we need to bring into the open the educational sense in which learners are becoming willing to do, or to be. We hope that our research will guide that of Sterling et al. (2017) who describe an intention to "*Develop a method of inquiry and a robust advisory framework.* " (159) to address these matters and that of Lozano et al. (2017) who claim "*To better develop mind-sets and actions of future generations, we must provide students with a complete set of sustainability competences*." (1889). We also hope that our research will be relevant to those educators who separate learning outcomes that are to be demonstrably achieved, from those that are more aspirational in character. Identifying an outcome as an aspirational attribute (such as a graduate attribute) is common practice in some parts of the world (see for example Barrie, 2012) but creates similar obligations for assessment or evaluation as more formal outcomes. If an outcome described as competence is obligatory, but willingness to use that competence is aspirational, we hope that the future lexicon of ESD will emphasise that distinction.

With reference to higher education, and drawing from what we have learned from de Haan (2010) we are also drawn to the argument extended by Fien (1997) that, in the context of ESD, we cannot be neutral. For Fien, being neutral simply supports the status quo that in essence is unsustainable. There are here direct links to other higher education issues in the context of boundaries and academic freedom. Do our countries extend academic freedom to university academics to be pro-sustainability? Certainly, and in some cases this is obligatory. Sweden, for example, anticipates that its teachers will in some senses educate for sustainable development (Pauw et al. 2015). What then of climate-change denial and the academic freedom to be something other than neutral in this context? Away from sustainability, we note concern in some countries at present about freedom of speech on our campuses with respect to incitement to racial violence (Haidt 2016) or teaching creationism. Similarly with democracy and honesty. We are drawn to comparing ESD to that for these other worthy things, but note that each has its own boundary problems. For some, democracy is at the heart of consumerism and sustained unsustainability (Blühdorn 2013) and for others, with respect to honesty, property may or may not be theft (Roy 2016). Our research does not help us to identify where the boundaries should be for others, but does encourage us to ask our colleagues as they develop sustainability programmes and outcomes and educational models, to explore openly and transparently the boundary implications of what they propose.

In the spirit of exploring these boundaries ourselves, in our last videoconference session, we asked ourselves if, as university teachers, we are willing to teach and assess sustainability outcomes to our students that involve being willing to adopt sustainability. Far from evading the question, our post-hermeneutic responses were nuanced but precise. We agreed that descriptions of learning outcomes or aspirations, whether as competencies, capabilities or something else, that fail to describe in educational terms the pedagogical imperatives of engagement and of assurance of learning, are unlikely to help the mission of ESD; and indeed likely the cause of at least three decades of miscommunication within ESD.

Conclusions

We asked ourselves how particular conceptions of ESD- and sustainability-competencies and capabilities, described in identified research articles, relate to explicit, or implicit, expressions of the pedagogy suggested for their teaching, and learning. We concluded that educational meanings of the widely used terms 'competence' and 'capability' are not adequately understood and shared to be helping ESD and HESD to progress. ESD and HESD are complex, multidisciplinary fields of enquiry, drawing on concepts and terms from different disciplines and different languages. Although the broad aspirations of these fields may be shared widely, their translation into pedagogical practices that can be effectively implemented and communicated within the field of enquiry is proving to be troublesome.

We suggest for these terms in particular, and perhaps more widely, that:

- Where terms are drawn either from general English usage, or from established usage in the educational literature, and applied for specific purposes in ESD, they need to be defined clearly with respect to their educational context. In general usage, 'capability' and 'competence' have broadly similar meanings. Attempts to narrow and restrict each for specific purposes in ESD, is not helping communication within this field of enquiry. Adding adjectives such as 'key', without further elaboration, does not help a word that is already struggling to be heard.
- In general, terms such as 'competence' that already have a general usage that specifically restricts their meaning, should not be used in ESD in a way that ignores these specific restrictions. In general English usage, competence does not include a performance element, or indeed, a requirement that competent people should be willing (in every situation and context) to perform their competence. ESD and HESD would do better to develop specific terminology for this purpose; perhaps including the word 'willing'.
- Moving words that may already be poorly understood in one language, into another language, may not even be truly useful for fluent speakers of both languages.
- ESD does need to agree terms that adequately describe educational

processes designed to change what learners will be willing to do or to be, as different from processes designed to change what learners know or what learners can do, if they choose to. It seems unlikely to us that ESD can move on until it can adequately distinguish between these profoundly different educational objectives. One approach that may assist our collective achievement of this end, while simultaneously benefiting, in a meaning-making sense, from the inconsistent, confusing and contradictory ways in which our vocabulary has evolved and as identified in this article, is for our field of enquiry to deliberately and specifically question every intended learning outcome, or objective, that its participants seek. What pedagogical approaches will be used to achieve this outcome? How consistent are the outcome and pedagogical approach with the mission of the education institution involved, with the abilities, values and freedoms of those tasked to teach, and with the freedoms and rights of the learners involved? How will achievement of this outcome, by individuals or cohorts, be assured? Responders to some questions, but not all, should be questioned further.

We suggest that these needs are pressing. Sterling et al. (2017) for example, call for "*broadly acceptable, detailed descriptions of the sustainability competencies that could provide suitable guidance for programme and curriculum development or major re-organisation of academic institutions*" (163). Until we collectively adopt less contradictory and inconsistent uses of 'competence' and 'capability', and simultaneously find ways to link these concepts to particular conceptualisations of pedagogy which would be necessary to develop them, and to assess them, we would do well to delay our requests for major re-organisation of academic institutions to achieve them.

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