Aware, Care, and Share: A Fair World through Entanglement

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This text ventures a discursive-analytic understanding of Karen Barad's notion of *entanglement* as expanded interdisciplinary action and applies it to both art and art- and design education. To what extent can Barad's view be translated for use in an artistic art education context? To what degree does artistic art education already integrate her concept? *Entanglement*, to Barad's understanding, means more than interdisciplinary thinking and acting, more than binary acting; it is a being-in-the-world, a connectedness. Interdisciplinarity is replaced by *entanglement*. Ontology, the *sense* of being in this world, determines the approach, which is determined by the notion of being part of this world. Such a view implies a completely different approach to responsibility *in* this world.

The following text takes a closer look at thoughts drawn from my own didactical position with the aim of understanding the extent to which *entanglement*, understood as expansion, or *agential realism* can lead to a paradigm shift in art and design. Entanglement does not allow for 'pigeonholing' into one discipline, one subject, one focus, as this particular understanding calls for viewing, feeling, and analyzing the world from within. The following interweaves agential realism with aesthetic, sensory cognition. It also asks how and whether contemporary tendencies can, or must, make their way into the classroom.

A Critique Before the Analysis

As I noted back in 2014, although "interdisciplinarity is demanded in the preambles of higher education policy research concepts" and has been "a mainstay of [particularly elementary and secondary] school education- and curricular

plans for decades, it is rarely applied in practice."*[1] Inter- and transdisciplinarity are understood differently in elementary- and secondary school settings as opposed to university contexts, as the terms are usually not precisely defined and interdisciplinarity is not a part of the lived experience. Structural conditions in higher education virtually prevent interdisciplinarity and an entangling of subject areas. Bayrhuber et al. take the view that academic subjects in and of themselves significantly contribute to world orientation in the sense that they build knowledge and skills; at the same time, they also question whether subjects in their current form are necessary to that end.[2] They further emphasize that all prior attempts to establish interdisciplinarity and interdisciplinary teaching have proven very difficult. Scholars – including this one – often point to Finland as a model, a country that in 2014 implemented *phenomenon-based learning* in comprehensive schools (cf. additive and integrative).[3] For years, my own teaching practice has shown how subject matter, problematizations, and approaches can be entangled.[4] Interdisciplinarity, by contrast, is binary; it presupposes *the self* and *the self of the other,* rather than seeking to understand how intra-actions that *produce phenomena* connect and interconnect everything in a variety of ways, specifically "the phenomenon as a particular instance of wholeness, the fully contextual be-in where the matter and meaning meet."[5] Barad goes on to note that:

> Entanglements are not intertwinings of separate entities, but rather irreducible relations of responsibility. There is no fixed dividing line between 'self' and 'other', 'past' and 'present' and 'future', 'here' and 'there', 'cause' and 'effect'. Quantum discontinuity is not ordinal disjunction.[6]

Accordingly, *entangled art and design teaching* in schools, with its particular attitude and philosophy, might be more interesting for the world. Would this approach also exclude 'the othering' aspect, or even not allow it to come into the world in the first place, and instead cultivate more of a 'both-and' paradigm? The time has come, in my opinion, to finally allow the Augustinian two-city

1 Cf. Mateus-Berr, 2014, p. 209.
2 Cf. Bayrhuber, Abraham, Frederking, Jank, Rothgangel & Vollmer, 2017, p. 25.
3 Since then, Finnish schoolchildren have been required by curriculum to participate in one interdisciplinary project per term, such as a week-long mathematics fashion project, for example. There still are individual subjects, however.
4 Cf. Mateus-Berr, 2013/2020.
5 Barad, 2015, p. 43.
6 Barad, 2010, p. 265.

model – which would have Christians decide between *civitas Dei* (the heavenly city) on the one hand and *civitas diaboli* (the city of the devil) on the other; that is, between good and evil – to disappear. As Mikhail Bakhtin already observed, "If carnivalistic *ambivalence* should happen to be extinguished in these images of decrowning, they degenerated into a purely *negative* exposé of a *moral* or sociopolitical sort."[7]

Center for Didactics of Art and Interdisciplinary Education

In the following I describe my didactic expertise as an artist, social designer, researcher, art therapist, professor at the University of Applied Arts Vienna, and teacher at a general secondary school in Vienna (Schulschiff Bertha von Suttner [School Ship Bertha von Suttner]) (Fig. 1–4). I founded the Center for Didactics of Art and Interdisciplinary Education in 2019 as a new forum for subject-didactic research at the University of Applied Arts. I had previously worked in a school setting since 1991. Having always taken an interdisciplinary approach to the material conveyed, I have continued that practice at the University of Applied Arts Vienna since 1992, and have headed the Department of Subject Didactics there since 2013. My interdisciplinary study and research projects are widely published in academic journals and regularly receive third-party funding from (inter-)national research funding programs, which is striking for art didactics, a comparatively 'minor' discipline in Austria.[8] After reading Barad's writings, I wondered whether such conceptualizations as 'interdisciplinarity' are even necessary anymore, whether they shouldn't be replaced by Barad's use of the term *entangled*, and what change that might bring about. *Inter-/transdisciplinary* concepts presuppose binary subject constructions. *Entanglements* look at the whole; they feel phenomena.

When I was a university student (1983–1990), the disciplines were strictly separated, to the extent that a trained painter could not possibly be a sculptor. Photography was not (yet) considered an artistic discipline, and painting was declared 'dead' in 1990. Art educators in schools kept (and still keep) large folders into which students (had to) sort their work by discipline: architecture, sculpture, design, graphic art, visual media, etc. While these subjects still in fact exist, even at art universities, the various forms of materiality of

7 Bakhtin, 1984/1999, p. 126; see also Mateus-Berr, 2007, p. 24.
8 Cf. Mateus-Berr, 2002–2022.

expression to emerge from them is different. Bodies have retreated.[9] Materiality no longer plays a role. All objects have a deep cultural significance. As Jean Baudrillard observed, they have lost all their functional identity and have transformed into simulacra (one could also say avatars) of themselves.[10] The real has become our real utopia, and yet utopia is no longer the reality of the possible that – like the dream of a lost object – can only be dreamed. It seems to Barad that "it seems that at every turn lately every 'thing' – even materiality – is turned into a matter of language or some other form of cultural representation [...] the only thing that doesn't seem to matter anymore is matter."[11]

Heibach and Rohde speak of a 'material turn,' which is to say a complex scholarly narrative "in which things are understood as actors in networks of cultural processes."*[12] This turn can be understood as a political and spiritual turn. For Barad, "the primary ontological units are not 'things' but phenomena – dynamic, typological reconfigurings/entanglements/relationalities/(re)articulations of the world."[13]

Indeed, the University of Applied Arts has also consistently engaged with the idea of inter-/ cross- and transdisciplinary study tracks and has also established some. This engagement was preceded by an acknowledgement that the world could no longer be understood solely from within divided disciplines and that – following Hannah Arendt's concept – thinking, or rather inter-thinking more productively occurs between disciplines.

Nevertheless, art education at the University of Applied Arts Vienna was considered a purely scholarly subject. This ran contrary to my own ideas, as I understand art education or, like some say, art didactics to be an entangled and therefore artistic subject in addition to being a scholarly one. If contemporary school and society demand interdisciplinary approaches – because the world has become so complex that one discipline can no longer adequately explain it – then it is for subject-didactics to discuss this. The *Deutsche Gesellschaft für Fachdidaktik* (GFD, [German Subject-Didactics Society]) has been engaged with the concept of *general subject-didactics* for some time now.[14] General subject-didactics, as understood by this work group, is a comprehensive

9 Cf. Kamper, 1999/2008.
10 Cf. Baudrillard, 2006.
11 Cf. Barad, 2007, p. 132.
12 Heibach & Rohde, 2015, pp. 9–30.
13 Barad, 2007, p. 141.
14 Cf. Bayrhuber, Abraham, Frederking, Jank, Rothgangel & Vollmer, 2017.

theory of subject-focused learning, which is consequently elaborated into a metatheory of subject-didactics. Its authors were faced with the central task of analyzing "how subject-specific learning exists within the subject, and how it tends to point beyond itself and toward the development and building of interdisciplinary skills and abilities."*[15] They aimed to develop new competency models, in particular by exploring how cross-disciplinary knowledge and skills are acquired. This project was preceded by a detailed analysis of subject-based learning. Evaluation consisted of a brief outline on the history of the subject, followed by the criteria of the subject's self-understanding, which is to say learning *within* the specific subject (Subject competencies – content. Definition of subject matter; subject-specific competencies: active engagement with the world, reflection; imagining, designing, creating, presenting, describing, analyzing, interpreting, evaluating within the art subject area; problem-solving creative action and thinking) as well as learning *outside of the subject* (linking content across subjects, generalizing subject-specific competencies). These competency templates have been similarly defined in Austria for the subjects Art Education (visual practice, reflection, presentation and documentation) and Design Education (development, production, and reflection with materials and techniques).

In contrast to other disciplines, in the art and design education and the many theories and practices of associated subjects are experienced and understood in an entangled way (i.e. both artistically and in a scholarly sense). As in agential realism, practice is integrated into theory: "theory reflects context epistemologically and ontologically"*[16] and – in the case of art-related subject didactics – also reciprocally. Yet here, too, there is a need to expand competencies and awareness of the world's interdisciplinary development among art education students and trainee teachers as the various disciplines (pillar subjects: art/design and art/design theory, didactics, school practice, pedagogy, cognition-process space[17]) are taught separately there as well.

Art education fulfils a bridging function between specialized areas of study (at art universities, both the artistic and theoretical departments and workshops) and general didactics. Consequently, art education regards itself as an interdisciplinary communication platform between artistic and design disci-

15 Ibid., p. 23.
16 Barad, 2015, p. 50.
17 Cf. Mateus-Berr, 2011a, 2011b, 2011c; Mateus-Berr et al., 2011; Mateus-Berr, Diaconu & Vosicky, 2011.

plines, artistic research, art and design pedagogy, art theory, cultural theory, design theory, architectural theory and philosophy, game-based learning, museum education, art therapy, new media, life-long learning, pedagogy-related subjects, and other disciplines including the natural sciences, health, citizen science, social entrepreneurship, museum education, social space, science centers, urbanism, socially-engaged art, socially-oriented design, etc. It is inclined to reference neighboring disciplines in matters of theory, method, and research. The center of didactic and interdisciplinary education at the University of Applied Arts in Vienna enables competence acquisition in both school settings and in the extracurricular space.[18]

In this case, art education, to my understanding, exists at the intersection between the arts, theory and other related fields, and few of those involved perceive it as a whole. Nevertheless, I view practical and related theoretical fields as already implicit in and integrated into any study of the arts. They are expanded in the associated subject-didactics, wherein they are made explicit and reflected upon. Consequently, in subject-didactics, all subjects are conceived together and condition one another. Practices and theories are *reciprocally entangled*.

Regardless of a trainee teacher's subject-specific area of focus, they stand to benefit from interdisciplinary or entwined experience in cooperation[19] with other disciplines as early as their own university education, as this will enable them to apply such a method either in a school setting or in a non-school-related professional field later on. Since 2005, I have realized, documented and published University of Applied Arts projects incorporating such diverse subject areas as music, religion, mathematics, hearing acoustics, computer science, medicine, physics, Scandinavian studies, economics, climate research, digitization, sustainability, energy, history and many more.[20]

This particular approach to art education in no way precludes, for example, empirical studies on subject effectiveness so as to continually evaluate various knowledge possibilities in iterative modes of review. As Gert Selle has stressed, "art education today would necessarily have to continually correct and reconfigure itself in a fluid context of observation, reflection, and experimentation, all with a view to parts of the cultural present; it is to be under-

18 Cf. Mateus-Berr, 2020.
19 Cf. Bayrhuber et al., 2017, p. 253.
20 Cf. Mateus-Berr, 2013/2020, pp. 73–116/pp. 1–97.

stood as a mobile potential in the making and not as training that can in any way ever be considered complete."*[21] Barad also asserts that it is essential to be able to do empirical research, but she considers agential realism a critical tool for which the objective reference must be considered as *material-discursive phenomena*.[22] Though the one does not preclude the other, it differs from what we are used to.

In essence, according to Schnack (2011), there is a distinction to be drawn between *additive and integrative* approaches to interdisciplinary learning.[23] The *additive* approach presumes subject-specific teaching, which is then supplemented with content and methods from other subjects as the occasion arises. It is also possible to teach the same topic simultaneously in different subjects. Teachers can implement this form with no significant curricular changes. The *integrative* approach, by contrast, focuses not on subject-specific instruction, but on a complex problem that is approached from the perspective of various different subjects. Relevance to lived experience and action framework often play a prominent role. Field reports also clearly show that interdisciplinary learning and its development are not only a didactic matter, they also indicate further evolution in terms of school organization. Interdisciplinary teaching usually occurs in team teaching situations.

For my own teaching I developed the design rhizome, a concept reflecting artistic and design processes from my own perspective. This image, inspired by Gilles Deleuze and Félix Guattari (Fig. 5),[24] can in the literal sense be understood in terms of the cyclical learning method, but is above all a metaphor for *entanglement*. The concept also alters the typical image of the educator: in this setting, rather than impart knowledge, the teacher accompanies and organizes. Students become active participants in the social construction of knowledge.

Barad's *agential realism* concept puts thinking about language, discourse, and objects on radically new footing. Among her inspirations was the work of Danish physicist Niels Bohr, who had designed "a new epistemological framework that calls into question the dualisms of object/subject, knower/known, nature/culture, and word/world."[25] Bohr describes the parable of a person in

21 Selle, 2004, p. 6.
22 Cf. Barad, 2015, p. 180.
23 Cf. Schnack, 2011; see also Popp, 1997, p. 149.
24 Cf. Deleuze & Guattari, 1977; Mateus-Berr, 2013/2020; Mateus-Berr, 2014.
25 Barad, 2007, p. 821.

a dark room trying to feel their way around with a stick. The manner in which the stick is held determines how it is perceived: Hold it loosely and it is an object that facilitates the sense of touch. Hold it tightly and it becomes an orthosis, an extension of the person holding it.[26] Barad notes, moreover, "that seeing is an achievement that results from specific bodily engagements with the world."[27] Although not present per se, it allows objects to emerge only through what she calls "*intra-action* with and as part of the world."[28] This thought not only allows for the envisioning of new tools for this world, it creates space for creativity, imagination, intuition, and implies responsibility,[29] in Barad's terms, the "incarnate relation that precedes the intentionality of consciousness."[30] She argues for a re-measuring of the boundaries between objects, our instruments, language, and human observers. Quantum physics, in her estimation, requires a new logical framework that integrates observational processes. In sympathy with Bohr, she links philosophy with physics.

Barad's focus is on a series of problematic dichotomies, an exploration of existence at the intersection of matter and meaning. Humankind and so-called apparatuses must, from her perspective, be seen as integral parts *of the* universe. This is another way of thinking about responsibility in this world. Moreover, Barad's discussion of instruments is preceded by her concept of the *personal equation*. The physics didactician Simon F. Kraus, for example, describes influences on measured values and their dependence on the person of the observer, a factor discovered by Friedrich Wilhelm Bessel, resulting in significantly improved data sets.[31] Kraus asserts that, thanks to Bessel's experiment, "belief in the authority of the observatory directors of the time in stating 'true measured values' was exposed as a fallacy."[32] It definitely showed that there can be no such thing as a 'true value' – i.e. objective value – where classical observational methods are concerned. Kraus views this experience of the interdependencies of different dimensions as essential to physics didactics in an age of growing faith in technology. He appears to think it important that students reflect on process chains and their own influence

26 Cf. Bohr, 1963a [1929], p. 99, cit. in Barad, 2012/2020, p. 46.
27 Barad, 2007, p. 156.
28 Ibid., p. 146, emphasis added.
29 Cf. Mateus-Berr, 2020, pp. 145–155.
30 Barad, 2007, p. 392.
31 Cf. Kraus, 2017, p. 23.
32 Ibid., p. 26.

on observations and measurements. To this end, he suggests drawing a connection between this subject-specific topic and insights from the psychology of perception. Barad describes process chains by way of the Stern-Gerlach experiment – which led to the chance discovery of quantized spin (i.e. the angular momentum of electrons) – while considering, among other things, the *intra-actions* of the two men, a cheap cigar and its aerosol-chemical effect on the plate, socio-economic backgrounds, material practices and *performativities* as key factors in arriving at that particular scientific finding.[33]

Intra-actions show interrelationships between people, nature, the material and the artificial, or – as Barad terms it – the "nonarbitrary, nondeterministic causal enactments through which matter-in-the-process-of-becoming is iteratively enfolded into its ongoing differential materialization."[34] She concludes that "*agential realism* gives us a technology of embodiment."[35] Understanding this approach, it becomes clear that an interrelation with the Other describes the absence of one's own existence, as "existence is not an individual affair."[36] Indeed, Barad views intra-actions as socially constructed theories with real, material consequences.[37] Her *intra-actions* and *embodiment* describe a *being-in-relation with the world;* she pursues a multi-perspectival, constructivist worldview.

A key principle of this approach is that of constructivism; described in the words of Heinz von Foerster, "the environment as we perceive it is our invention,"[38] our construct. It is we who construct prejudices against others and images of people and things. Everything we learn is socially constructed. Listening carefully, learning to understand the constructs of others, making feelings and sensory impressions comprehensible to others is often easier to translate into artistic media, signs and symbols than language alone; it is its own form of language acquisition, one that can be experienced. A constructivist, cybernetic worldview supports interdisciplinary thinking. Constructivism is thus primarily a form of cognition and attitude, not of teaching.

33 Cf. Barad, 2020, p. 58.
34 Barad, 2007, p. 179.
35 Barad, 1996, cit. in Barad, 2007, p. 45, emphasis in original.
36 Barad, 2007, p. ix.
37 Cf. Barad, 2015, p. 58.
38 Von Foerster, 2003, p. 212.

Transfer to Art and Design Education

"Is reality an amorphous blob that is structured by human discourse and interactions?"[39] And: "What is the outline? [...] It is not something definite. It is not, believe it or not, that every object has a line around it! There is no such line. It is only in our own psychological imagination that there is a line."[40]

This finds Barad's inquiry leading into art. A description of non-existent outlines (as articulated by the physicist and Nobel Prize winner Richard Feynman) serves to challenge perception on the whole: How does one sketch, or what does one actually sketch, if there are no outlines? And do they actually exist?

Perhaps it is more essential – to think with Barad – to return, for example in design, to the original French designation of origin, which is to say 'sketch, outline, illustration, having something in mind.' Michael Erlhoff and Tim Marshall describe the difference in the meaning of the word in German versus English usage, where *design* refers to the conception or mental planning of an object and at the same time anything that is in any way designable.[41] Richard Niesche and Christina Gowlett recommend Barad's philosophy for training in educational leadership roles.[42] Anne Phelan knows the problem of expected recipes[43]: "[...] one teacher candidate's struggle to let go of a conception of knowledge as generalizable formulae that can be readily applied in practice and to become more open to practice itself as a site of learning."[44] She sees opportunity in teaching practice, first and foremost in having to learn to deal with the notion of 'uncertainty/unpredictability.' In 2020, Jasmin Kaufmann completed her MA at the Zurich University of the Arts; her thesis, titled "Touched: An Aesthetic-Theoretical Investigation of Touch as Relationality and Site of Subjectivity in the Context of Art,"* examines processes of touch between people, but also those involving matter that is perceived as *lifeless*.[45] Fabian Ginsberg contributes yet another art-educational position with *scripted reality,* which likewise references Barad.[46] Petra Kathke writes about Barad in the

39 Barad, 2007, p. 42.
40 Cf. Barad, 2007, p. 156.
41 Cf. Erlhoff & Marshall, 2008, pp. 87–92.
42 Cf. Niesche & Gowlett, 2019.
43 Phelan, 2005, p. 339.
44 Ibid.
45 Kaufmann, 2020.
46 Ginsberg, 2020.

context of elementary school education,[47] after which transfer attempts become rather tepid.[48]

Art Entangled

Contemporary philosophy, texts, and discourse should occupy an important place in art- and design education subject-didactics, as a matter of keeping pace with the latest research and to enable the further evolution of the discipline. Subject-related discourse has yet to test or document the application of Barad's theses, or their transformation into a corresponding teaching practice, in any significant way. It seems much more essential to me that the teaching practice should not be concerned solely with illustration; processes based on artistic research are far more engaging. Yet in this case, it might also be better to enhance teaching quality through the literary appropriation of her writings (that is, teachers read Barad's texts, develop a different attitude to the world and consequently enact a different approach to teaching) than to work directly with children and teenagers to 'apply Barad.' Conveyed, thought-provoking ideas have to do with uncertainty, unplanability, breaking down preconceptions, worldview, responsibility, etc. There remains a great deal to try out and subsequently analyze, including where we might succeed in overcoming dichotomies and perhaps even in reconciling an apparent and constructed oxymoron (that which is incompatible) ourselves, which is to say coherence within ourselves and in (the) teaching (of art). Translating Barad's philosophy into art- and design pedagogy could potentially give rise to new values. It carries within it a potential revolution, also in education.

47 Kathke, 2018.

48 Kathke describes "the disappearance of things and their digital producibility"* (ibid., p. 47) and calls for this reason "to take seriously the challenge of dealing with materiality in artistic teaching/learning processes and to cultivate it beyond mere *craftsmanship*" (ibid., emphasis in original).

Fig. 1

Fig. 2

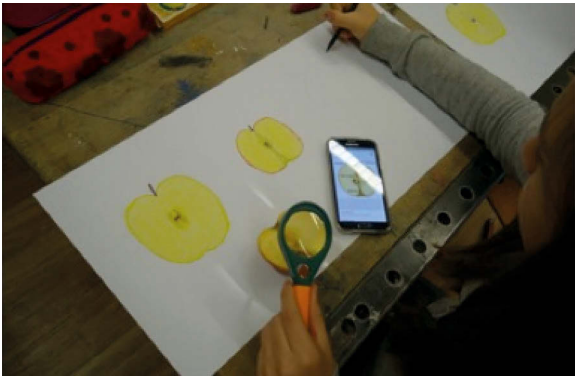

Fig. 3

Fig. 4

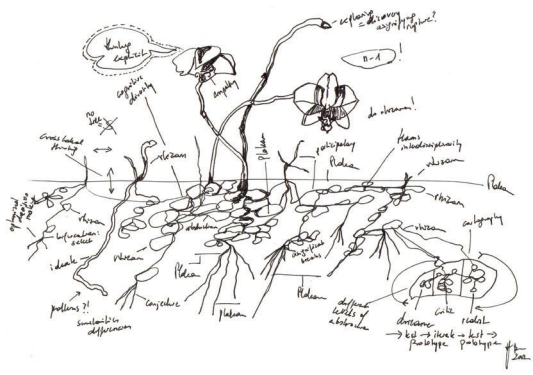

Fig. 5

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Figures

Fig. 1: Book project and -cover "When the World started to Dance," https://interacct.cs.univie.ac.at/index.php?item=participants [26 May 2022], photo © Ruth Mateus-Berr.

Fig. 2: Scene from art class, photo © Ruth Mateus-Berr.

Fig. 3: Scene from art class, photo © Ruth Mateus-Berr.

Fig. 4: App design project, photo © Ruth Mateus-Berr.

Fig. 5: Concept of Designrhizom, photo © Ruth Mateus-Berr.