Curricular Experiments for Peace in Colombia: Re-imagining Science Education in Post-conflict Societies

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When a person decides to share their stories after years and years of war and pain,... they are allowing us to pick up some “lenses” to see through their eyes at that black huge space full of tiny spots back to the past, and recover history in their hearts and souls.

—Dalia (Participating Student, Personal Conversation, 2016)

In 2016 we were given the opportunity to dream, large, of a science education that emerged from a transitional period in a country torn apart by more than five decades of internal conflict, Colombia. Invited by Universidad Nacional de Colombia, we were given freedom to reimagine science education for a 10-day course, part of the International School, which opened both to students and professionals from any background. Approaching reality as changing and emergent, the science education we were able to dream became the one we were able to construct as part of a moment still marred by bullets and yet hopefully (re)written by education: “Science Education for the Construction of Peace.” As one of the students who contributed to this

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dream, Layla, states: “Maybe peace building is not necessarily to forget and forgive, sometimes it has to do with remembering.”

In this chapter, we present a story of dreams and hopes, of what is possible, of a changing present, of a transitional period positioned in Colombia but relevant to any corner of the world. Most of all, we present a story of a possibility to imagine a science education that contributes to rewriting history, through entering the window to the hearts and souls of those who have lived in fear and also hope for so many years. To best represent the complexities of this journey we were privileged to take, we constructed this chapter in a nonlinear way.

Firstly, we present a narrative we created drawing upon truths as articulated in the participants’ comments, sometimes presented as direct quotes, and fictional realities of possible futures founded on our experience with the participants and the collective perceptions of the future we were imagining together. We worked with the narratives, reflections and chains of conversations that emerged over 10 days between the three of us, who guided the course, and the participants. The emotional tone of the story reflects the multiple subjective views and feelings regarding the future and the past that the participants shared. The narrative is placed in the near future.

We positioned the story in Escher’s (1953) invention of multidimensional worlds in his art piece *Relativity*. We were privileged to come to understand diverse visions of transitional Colombia through the stories of futures yet to be created that some participants shared. Their visions of futures we found similar to the defying, creative and innovative nature of Escher’s work in *Relativity*. In his work *Relativity* (1953), as viewers “we have to reconcile blatantly impossible images. While we can easily make sense of the individual components in the picture, trying to establish their relationship to each other is bewildering and forces us to see either a crazy world, or just lines, shapes and shading” (Romanin, 2018, p. 78). The transitional and future Colombia will only be possible as a multidimensional world in which diverse realities, visions and past experiences of healing and reconciling co-exist in a yet-to-be-constructed, innovative, peaceful society.

Escher’s work inspired us to create a multidimensional narrative, to move the story beyond representing the diverse views of the present and future of the participants, to represent the hopeful, positive, emotional, interconnected and complex views of futurity that the participants had regarding the transition towards a peaceful Colombia. For this, the main character of the story represents multidimensional worlds, created from the diverse stories and views of futurity presented by each participant, and the personal experience of one of the authors, Carolina, of growing up in Colombia during periods of possibilities of peaceful futures that did not become materialized until 2016. The narrative is set in the future, year 2050.

To create the narrative of futurity, we also followed Feminist Standpoint Theory (Harding, 2004). Feminist Standpoint Theory allowed us to situate knowledge in context, and consider context as emergent, and part of

constructed realities where all actors interact and participate, including the non-human. This theory helped us to open spaces hardly imagined in what some have called the Anthropocene; to reimagine the non-human as central to human life, and how the human and non-human share indefinite entanglements that can destroy but also construct dreams of hope. Moreover, as was observed in our course, the non-human can impact how humans generate language for expressing feelings and create context. Many of the participants used metaphors with the more-than-human created world to represent their views of futurity. As we have also seen in other studies, science education can also help to share experiences of loss and hope that otherwise would not be unlocked (Castano Rodríguez et al., 2019).

We hope that this chapter inspires others to dream and construct an education that offers opportunities to share experiences of loss, experiences of truth and reconciliation alongside dreams of futurity.

COLOMBIA, YEAR 2050...

2050, this will be my last entry in this diary. My journey to reconcile my past and reimagine my new me has finished. I am my new me. During my last 34 years, since the Peace process with FARC (Fuerzas armadas revolucionarias de Colombia) started, I worked to reconcile the loss of several of my friends who disappeared during a time when many people were disappearing and had been kidnapped. I grew up in a very difficult social situation in Colombia. A time when cars were more than transportation devices, they were also bombs that could and did kill many. A time when my parents would go to work to the Candelaria, the city centre, and I would not know whether I would see them again. I wrote what I felt about Colombia when the peace process started:

When mass media feeds us descriptions endlessly confirming this condition these thoughts only get worse. When they lead us to believe that we have been in the longest civil war in all the history of humanity, a civil war that has claimed the most number of lives out of any other, a civil war responsible for the most of the missing persons out of any other, we are left in a state of sorrow that is difficult to overcome.

The peace process meant, among many changes, that ex-FARC members were now going to live among us and that at any time I was going to interact with one of them. I have to first accept and understand that FARC's original ideology did represent many Colombians, and that the violent Colombia in which I grew up, represented more than just one group using violence to accomplish their goals. It was hard to imagine a less violent Colombia; really it was impossible for me to imagine it.

I started this diary during the peace process. One of my first entries was about a reflection I wrote regarding how I was feeling about going through the process towards a peaceful future; water served me as metaphor:

Water is steady sometimes, quiet and apparently calm, but there is always something happening beneath; like us, steady, quiet and in apparent calm, just because it's so painful and even scary to think what we can find if we submerge and look deep in the bottom. ... But water always moves on, that movement includes rapids, vertiginous falls, knocking rocks, to at the end finish the trip in a sinuous and calm way to the immense and unknown.

We need to look down, to submerge in the pain and recover stories from the deep, we need to throw the fish nets and catch those stories, bring them back to the boats and navigate with them.

Like water, I decided to navigate with my past, to remember it and wear it to continue flowing through the present and into the future. Not moving away from it but moving with it. So, I started my life project. My journey had metaphors not only with flowing water, but also with colours. I learned to accept my feelings and accept that everyday could be felt differently. It was like a rainbow, many feelings were caused by a storm, producing many colours and creating a beautiful rainbow. In that moment I wrote: "Tell me, what is the colour of your peace?" And the answer is that it is all colours; it is a rainbow of colours, representing diverse emotions and experiences, that when together they form a beautiful rainbow full of hope.

When I accepted my rainbow of emotions, and was willing to navigate with them in a river full of rapids and also with many sections of calmness, I realised I was "ready to forgive" and be part of a peaceful Colombia. One of the many thoughts I started to reflect on during that initial time of my journey, through remembering and forgiving, was the thought about "otherness." I needed to start seeing people who had committed acts of violence, for whatever reason they had, not as others, but also as Colombians working towards peace. That process made me think beyond FARC to any member of a society, including all life forms. I asked myself, how could we start seeing and interacting with all living beings, in a way that could help to construct peace? So, I came up with a few words that I needed to incorporate in my daily life to move beyond otherness: "tolerance, respect, identity, compassion, care, integration, affect, sensibilization, LIFE."

During these first stages of my healing process, and while thinking of otherness and a peaceful future, a group of people often forgotten by society came to my mind: people in the prisons. I decided to investigate more about prisons, and came across this story in YouTube, https://www.youtube.com/watch?time_continue=183&v=WxKI_t1wD4&feature=emb_title, of one of the prisoners who spent some time in Bogota's prison and then in a rural one. He stated that:

the people believe that the one who has been [a thief] will always be. Society does not let one change there is discrimination. And besides discrimination, there are obstacles. One is always classified like the bad one. And the bad one does not find work outside.

His interview made me question what role people in prisons could play in the construction of peace. How could they be better re-inserted into society if we want to construct peace? If we were serious about a peaceful Colombia, then we needed to consider all members of our country. So, I decided to focus on prisoners and what it meant to give them an opportunity to be part of a transitional period towards peace. I created a workshop called “Harvesting Forgiveness: Creation of Scenarios of Peace Futures in the Prison, through Education in Indigenous Agronomy” (translated from Spanish). The workshop addresses the needs for coexistence and reintegration of the prison population, empowering and paving restorative and reconciling routes for prisoners relative to the larger society of which they are a part and will return: in facilitating the education and participation of prisoners—during and after serving their sentences, in concert with farmers and other knowledgeable community members—in cultivating organic and native foods in networks of fair trade across the country. A focus on Indigenous agriculture and native foods, I felt, was also a way to recognize, remember, restore and revitalize the indigenous traditions of my country through the production of food in *chagras*. Chagras is a traditional Indigenous integrated system to cultivate plants, in which minerals, humans, other animals and plants all are considered to work in interdependent ways.

I first thought about this workshop during a course I took regarding peace and science education in transitional Colombia. The peace-oriented science sessions offered a subject context which enabled/supported sensitive conversations of a deeply divided and emotional nature. It was then when I felt empowered to consider how all the diverse communities that make up our beloved Colombia could co-exist and work towards peace. Now, 34 years since the peace process took place and my inner journey started, it is hard to remember how we lived among so much violence. As it was beautifully said by the former Colombian president, Juan Manuel Santos in 2016: “Las balas escribieron nuestro pasado, la educación escribirá nuestro futuro” (Bullets wrote our past, education will write our future). “Reconciliation” is how I can describe my journey towards healing, towards forgiving, towards remembering and towards co-constructing a peaceful Colombia. When I look back to that year, 2016, I remember all the diverse emotions, sometimes conflicting ones I had, and realised how all those emotions flowed like a river, sometimes moving in peaceful ways and sometimes in a storm kind of wave, but always with power; it moves forward, creating diverse possibilities like my work with prisoners and the endless possibilities it brought for me and for their sense of a future in co-creating peace.

THE BEGINNINGS OF OUR JOURNEY

Colombia, 2016, the year when the peace treaty with FARC was signed by the Colombian government to end one of the longest civil conflicts in history. Two local academics from a Colombian University and a Colombian residing

in Australia dared to dream about a science education for such a transitional period towards the construction of peace. We reflect on how peace-oriented citizenship considers the human and the non-human as central to harmonious living (Carter, 2015). We asked: What will collectivity and solidarity look like when most citizens, humans and non-humans, have endured a violent past but dream of a peaceful, harmonious future? What could and should be the role of science education in such a context?

The university's international school, which opens to students and the general public every year during June/July, provided the opportunity to explore these questions and allowed us to dream of a course in science education that responds to the social, political, and environmental context of contemporary Colombia. Over a week, these three academics explored the local context and envisioned how science education could respond to this transitional period. Two more academics, Steve Alsop and Molly Quinn, joined this team of dreamers. Wellbeing and science had already been explored by Carolina in diverse contexts (Carter et al., 2019; Castano, 2012a, 2012b; Castano Rodriguez, 2019). Steve brought his expertise in environmental justice and activism, and Molly provided the bridge to consider critical peace education. We discussed possible curricular approaches and disruptions needed to construct a course that was anchored in the needs and priorities of the Colombian society and which positioned educational spaces as sites of possibility and transformation. The course was open to everyone, students and professionals. Forty-five participants from diverse sociocultural and professional backgrounds, and at diverse stages of their careers, joined us. They were all interested in the space this course offered to reflect upon and to re-think society and the construction of peace for the human and non-human.

This journey of re-thinking science education towards the construction of peace in a transitional society entailed envisioning education and peace anew together, subjectively informed via context, culture and lived experience. Engaging participants with us in this transformational work, we had to inquire deeply into peace itself as well; the way of cultivating social and ecological justice, and cultures of peace, sustainability and activism. The inspections and interrogations we undertook to create this course were supplemented by the insights and offerings of curriculum studies— curriculum theory specifically, critical peace studies/education, transformative theory, critical pedagogy and feminist theories. These diverse theories informed the process of creation of this course.

RE-THINKING EDUCATION IN TRANSITIONAL COLOMBIA: CURRICULUM STUDIES, CRITICAL PEACE STUDIES/EDUCATION AND CRITICAL PEDAGOGY

Via curriculum theory—foregrounding the question of what knowledge is of most worth (Schubert, 2009; Spencer, 1884/2015), we were able to initiate “the interdisciplinary study of educational experience,” examine curriculum as

the intellectual framing of such experience, embracing subject matter, society and self, and engage autobiographical (*currere*) processes towards illuminating our own meaning-makings respecting such things as teaching, learning and justice—as lived (Pinar, 2012). Through curriculum theory we created spaces for sharing with each other our own stories of war, pain and possibility as well as our own avenues therein for agency, healing, and transformation—*experiences of loss, of truth and reconciliation alongside dreams of futurity*.

Critical peace education positions education as a site for transformation towards peaceful societies from the lenses of social justice and pedagogies of resistance (Quinn, 2014). Insights gleaned from the field of peace education—offering lenses for re-viewing, remembering and reimagining herein as well—we felt were also particularly apt for our shared consideration. With its ties to international and comparative education and to modern human rights movements, peace education—through its focus upon understanding the problem of violence writ large (Harris & Morrison, 2012), particularly structural violence, and its myriad forms (e.g., cultural, domestic, interpersonal, etc.)—enabled us to give studied attention to it (and in relation to identity, culture, context, education, epistemology, peace, science and such, as well).

Additionally, through the work of critical peace studies/education (Bajaj, 2008; Bajaj & Brantmeier, 2011; Verma, 2017), we drew upon analyses of colonialism, class, race, gender and other personal-political sites of difference making for complex, conflicting, confounded and contested expressions and experiences of violence and responses to them. Such theoretical grounding connected well, as well, with that of critical pedagogy, both traditions of thought rooted in the work of Paulo Freire (1970/1993)—also of Latin America—on oppression and liberation and the role of thoughtful awareness and reflective action (e.g., *conscientization*, problem-posing and *praxis*) in undertaking the “vocation of humanization” in a world of injustice, violence, and suffering—and this, via education.

We also learned from work aimed at critically understanding and attending barriers to peace—a term often negatively defined as freedom from various kinds of marginalization, domination, dehumanization and hostility (Oxford English Dictionary, 1989; Quinn, 2014)—and creatively considering ways to positively promote it: reimagining, *futureing*, education, science, subjectivity and peace. The role of education in the production and perpetuation of *epistemicide*, epistemic violence (Paraskeva, 2016; Paraskeva & Steinberg, 2016), specifically through the ongoing control and force of Western knowledge systems, and the abiding curricular legacy and legitimization of colonial and imperial ways of knowing and being could be interrogated (Noddings, 2012). The way and wisdom of other, indigenous, home-grown and -generated onto-epistemologies also could be explored, as counternarratives, decanonizing and interrupting the normative storyline(s), potentially offering opportunities for transformational restorying rooted in the context, culture, subject matter and subjectivity at play among us in coming together and collaborating in such

study. For instance, the peace park in Japan, inspired by the brave young girl Sadako and her thousand paper cranes (Coerr, 1979) in the radiation aftermath of the bombing of Hiroshima, compelled us to build our own peace park memorial in class, expressive of our dreams of and for peace, as issuing from what photographic and reflective writing concerning its presence in our own lives.

Such, while not explicitly so at the time, certainly involved “staying with the trouble” that Haraway (2016) endorses, through which we creatively composed new visions and vistas for peace for ourselves and others—seeking to “make kin” of each other and beyond, of the worlds of our own makings via our part and participation with, and posture towards, the natural world too—and via science education, from the place of as well as commitment to our entangled relationality and responsibility before the living and dying on a damaged earth, the yet to be born and fragilely emerging... especially here, intended reconciliation efforts in Colombia. As she so eloquently describes such work:

The task is to become capable, with each other in all of our bumptious kinds, of response. The task is to make kin in lines of inventive connection as a practice of learning to live and die well with each other in a thick present..., to make trouble, to stir up potent response to devastating events, as well as to settle troubled waters and rebuild quiet places ... , requires learning to be truly present ... as mortal critters entwined in myriad unfinished configurations of places, times, matters, meanings. (p. 1)

We knew that it was vital here, too, then to examine the forms of intelligibility made possible/impossible by our normative ways of seeing, being, thinking and doing—e.g. as epistemologically framed via capitalism, colonialism, Western imperialism and universalism. We knew it was crucial to consider whose/what lives are made unintelligible, and most vulnerable, therein as well (Butler, 2009)—in striving to advance peace as a critical (educational, curricular) demand and collective responsibility, to recognize the ways in which we not only fail but continue to further precarity in so many and to reach for an ethics of relationality that would enrich us—on/and the earth—all (Smits & Naqvi, 2015).

TRANSFORMATIVE LEARNING AND CARE-ORIENTED PRACTICES IN SCIENCE EDUCATION

How could science education contribute to empower marginalized societies and, particularly, how could it contribute to create lasting peace in Colombia? *Different figurations for worlds that can barely be imagined*, as the editors of this book encouraged us to consider, were possible to be imagined and constructed through the inspiring stories that the participants shared with us, their views of the future and the experiences of the past. Curriculum studies

and Critical Peace Education engaged us in reflecting and creating spaces for the participants to rethink peace and the many possibilities for reaching a more peaceful society, including reaching an ethics of relationality that includes the non-humans. Transformative learning encouraged us to consider transformation as central to access rational and emotional aspects of experiences of loss, truth, and dreams of peaceful future worlds.

Described originally by Jack Mezirow's work, transformative learning requires a process of emotional and rational confrontation (Dirkx et al., 2006). For transformation to occur, disorienting dilemmas, described as confrontational situations that will increase awareness of the diverse causes of an issue need to be present. The goal of this process is not only to increase awareness, but also to empower people to act and engage in change. In our journey of working with the possibilities of a peaceful future, the experiences the participants had with loss and their considerations of reconciliation as the main force to envision a peaceful future, provided the central triggering events for transformation.

Although transformation has not been central to science education, some authors have argued that science could promote agency and activism (Alsop & Bencze, 2015). When science education's aims are expanded to reconsider an ethics of relationality for creating a more peaceful world, transformation occurs and new possibilities for engaging with humans and the non-humans that enrich all are possible (Carter et al., 2014).

Finally, an ethics of care, initially described by Carol Gilligan in 1982, helped us connect critically, transformation and peace education, bringing the local to the forefront of our consideration of education in a transitional period towards the construction of peace. Ethics of care rejects the notion of universalisation and includes not only considerations of underrepresented groups in societies, but also of non-human species and natural systems (Gilligan, 1982; Noddings, 1992). Particularly, Noddings' (1992) centres of care provided reconsideration of science education towards the wellbeing of all life forms in the context of this transitional period in Colombia. Themes of care, now known as "centers of care"—caring for the self; caring for the inner circle; caring for strangers and distant others; for animals, plants, and the Earth; for the human-made world; and caring for ideas (Noddings, 1992) require expansion of our compassionate circle beyond those who are close to us, to include other species, nature, and diverse thoughts and ideas. Through the centres of care, a new science education can be created to foster consideration of all life forms and expressions such as diverse systems, cultures and social groups (Carter et al., 2019). Transformative learning and ethics of care theory allowed us envisioning a future of a post-conflict society and contributed to create a bridge to reconsider science education's role in this process.

RE-IMAGINING SCIENCE EDUCATION IN POST-CONFLICT SOCIETIES: TRANSFORMATION AND RECONCILIATION

We were given the opportunity to dream of a science yet to exist and a science education that is central to the construction of peace. We envisioned peace as a harmonious coexistence between humans, and with the non-human. Particularly, we were privileged with access to create a space of hope and solidarity with locals to rethink science education in transitional Colombia. Together, with the participants of this program, we re-considered how success in science education could look and what role it could and should play in a society that has endured more than five decades of internal conflict. Theories such as ethics of care, transformative learning and critical peace education provided the foundation for disrupting imported curricula to attend local needs and validate local experiences. We positioned participants as co-constructors of the course and agents of change and hope in their society.

Escher's art, and particularly the work *Relativity* (1953), also reminded us that imagining a science for a peaceful Colombia requires believing in science education's capacities to reformulate, share and experience loss, truth and reconciliation. A peace-oriented science education that contributes towards transitioning to peaceful societies could be perceived almost as impossible to be imagined in the Anthropocene. Yet, when we were given the space to reflect on the impossible, and to share it with those who have experienced a violent Colombia and were transitioning towards a peaceful future, we were able to co-create a space for this underexplored dimension of science. As Escher's work demonstrates, "Believing in the impossible allows you to invent and innovate. When the normal rules no longer apply, anything and everything is possible" (Doughty, 2018, p. 88).

Feminist standpoint theory served as an analytical and methodological resource for our curricular explorations, bringing local experiences as central to the consideration of futurity of science education in a context of peace building. Specifically, the concepts of "horizontality, reciprocity and solidarity" (Jaramillo & Carreon, 2014, p. 395) were brought by the participants as central to re-thinking science education towards peace and harmony. Central to this envisioning were pedagogies of resistance which view education as sites for practising more democratic participation, with horizontal decision-making structures (Bajaj, 2015). In this view of a new science, rural education and local knowledge and experience were prioritized by the participants. The concept of "reconciliation" was identified by the participants as fundamental to the construction of lasting peace in Colombia. Reconciliation was envisioned as a new form of solidarity and care for others, where others could be any actor of the conflict endured in the past.

This new vision of education sees understanding, remembering and also forgiveness as central to solidarity. It includes diverse experiences of loss and hope to construct a peaceful society. For science education it means to prioritize the local: local understanding, local practices, local personal histories. This

strongly localized knowledge and envisioning of the future requires education to be re-positioned as a site for resistance and transformation towards hope, care and peace. Within this framework, success is envisioned as the active construction of peaceful interactions between humans and with nature, with individuals equally valued, capable and empowered to become agents of change and transformation towards a peaceful Colombia.

In post-conflict scenarios, science and education could offer an important, powerful and very necessary way (standpoint) to reach out across radical differences and inequalities in acts of wishful dreaming together for a brighter future. And yet, education and science in this regard are so conflicted because they enable these dreams through familiar imaginaries that simultaneously obfuscate controversies and associated histories of inequalities and ongoing structural violence. Thus, following Escher's work *Relativity* (1953), we gleaned something of the "gravitational forces" and "impossible realities" constitutive of this world within which we live, and of the "impossible objects" with which we wrestle: a different science, an alternative education, new relations among us upon earth, peace restored or realized for the first time—and as an enduring verb, a way of being and becoming together here—perhaps, too, impossible. Such means, as Harding (1996) reminds, opening up to ways of knowing, alternative epistemologies, that counter the present dominant paradigm wherein social advantage advances epistemic disadvantage and vice-versa, and through such a future science that impacts life on earth-human and non-human—in more life-affirmative, sustainable and peace-producing ways. As ourselves, as justice, peace too, we pondered, is ever incomplete, ever becoming, and yet to come.

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