Putting Complexity to Work to Think Differently about Transformative Pedagogies in Teacher Education

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The complexity of teacher education is fascinating, illusive, and creative. While it is simultaneously difficult to grasp and conceptualize, complexity has real presence and effects, and needs to be managed and simplified for meanings to emerge. Given this, interest in complexity, and its value to education more broadly, has grown rapidly over the past two decades (Davis & Sumara, 2006; Osberg, Biesta & Cilliers, 2008). This turn to complexity is linked to three intertwined ideas. The first, which is ontological, involves viewing the world as organized relationally through highly connected and interdependent elements so that the focus becomes not about understanding what something *is* (an emphasis on the individual, essence, and being), but how it comes into being (a focus on becoming, emergence and affect) (Deleuze & Guatarri, 1987; Richardson & Cilliers, 2001). The second, which is conceptual, involves drawing on a renewed vocabulary and conceptual toolbox that enables generative ways of questioning the assumptions, normalizing logics and methodologies of educational practice (Haggis, 2008; Morin, 2008). The third, which is reflexive, involves researchers and practitioners being aware of the dynamic, partial, layered, and contingent nature of educational practice (Mason, 2008). Overall, this turn to complexity enables a flexibility for thinking about social organization without the

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reductionism to unfettered agency or deterministic structures (Davis & Sumara, 2006). While there is a rapidly developing set of discussions on the implications of accommodating complexity within educational research, few pedagogical applications of this way of thinking have been offered for teacher education (Cochran-Smith, et al, 2013).

In this article I use a complexity-based approach to examine the multi-layered acts of professional learning and assessment that provide a means for enacting transformative pedagogies in teacher education programs. By transformative pedagogy, I mean an approach that aims to enable neophyte teachers to examine what educational, moral, and political commitments help guide their work as professional teachers, as well as encourage and engender critical citizenship, reflective thinking, social consciousness, and disposition for social justice (Ukopokodu, 2009, p. 47). The philosophical arguments for and against such a pedagogy, particularly as it is enacted as a form of critical pedagogy, have already been discussed at length by a number of different authors and will not be revisited here (for example, see Giroux, 2009; Shor, 1992, Freire, 1970, Rancière, 2012). However, when considering whether transformative practice is possible, the empirical research evidence tends to provide a rather unsatisfactory answer of, "it depends." The very possibility of transformative practice appears contingent on a range of social, political, and material factors that constitute the landscape of teacher education. It is the configuration of these factors that enable the forms of student subjectivity and sets of experiences that act collectively to enable (rather than determine) a transformation taking place (Ovens & Tinning, 2009, Ovens, Garbett & Hutchinson, 2016). This issue, the complexity of enacting a transformative pedagogy through democratic and negotiated assessment, is explored in the sections that follow.

Putting Complexity to Work

Defining complexity is itself complex. Definitions, by their very nature, seek certainty and stability of meaning, which is ironic considering that these are the very qualities that complexity seeks to challenge (Ovens, Hopper & Butler, 2013). Putting complexity to work is also a complex endeavor, given that everyone (including teachers, students and researchers) and everything (including theories, classrooms and technology) are part of interdependently connected assemblages or systems. No position exists outside of the system, where someone may see its workings. The rich tapestry of life, which becomes the object of study, emerges from the self-organizing activities of the elements involved, existing only because of the aggregate effects of its constituent parts operating over time (By-

rne & Callaghan, 2014). Thus, all investigators are part of the system being observed, and they both affect and are affected by the system. This suggests that thinking differently with complexity is not only accepting a different ontological perspective on the researchers relationship with the object of study, but also has epistemological implications on how meanings are produced. As Cilliers (2005, p. 28) suggests,

> since different descriptions of a complex system decompose the system in different ways, the knowledge gained by any description is always relative to the perspective from which the description was made. This does not imply that *any* description is as good as any other. It is merely the result of the fact that only a limited number of characteristics of a system can be taken into account by any specific description. Although there is no a priori procedure for deciding which description is correct, some descriptions will deliver more interesting results than others.

Viewing teacher education as emerging from a constellation of factors in play at a particular moment problematizes the notion that there is a universal concept called teacher education and that that some recipe for "transformative pedagogy" can be easily implemented. Instead, this essentialist view is replaced with the notion that pedagogical practice is partial, decentered, and grounded in the particulars of history, place and people. From this perspective, there is no subject or identity fashioned outside of its own history and contingency (Giroux, 2009). Instead, there is a sensitivity to the emergent nature of teacher education as the precondition of its agency, and a recognition that, whatever practices are enacted in teacher education settings, they are enabled by a system of social relations and differentiations constituted by multiple, interpenetrating and layered systems (Alhadeff-Jones, 2012).

Haggis (2009) suggests that three implications arise for any complexity-based approach and which frame the balance of the article. The first is the necessity of looking across multiple levels and systems simultaneously in order to keep a sense of the relational nature different levels and systems might have on how learners, or practices within an institution, are constructed and governed. Second, the analysis must focus on the specific set of local conditions, attempting to articulate different aspects of these conditions, and some of the emergent effects which appear over time in response to the dynamics present in these conditions, rather than aim to articulate general themes to cut across a range of examples. The third implication is the need for any analysis to be done in relation to processes through time since emergent effects only occur if 'richly connected' multiple agents are interacting through time.

In respect to these lines of thinking, I first examine how teacher education is configured across different levels of organization in the New

Zealand education system, considering how curriculum policy at the national and institutional level enable transformative pedagogies oriented around themes of social justice to be enacted at the program and school level. I outline how I reconfigured two courses within a Physical Education Teacher Education program (PETE) in order to enact a democratic pedagogy structured around using negotiated grading contracts. The focus here is on how the configuration of each course influences the transformative potential of the course, particularly in respect to how the course assessment is responsive to the emergent and unpredictable while simultaneously feeding information into the aspiration of enacting a transformative pedagogy. Finally, I draw from an ongoing stream of evidence generated across the past five years (2010-2015) that included journal writing, taking photos, collecting learning artifacts, recalling informal everyday discussions and an annual focus group interview with students. At the same time I also worked with critical friends to provoke diffractive readings of this data as a basis for checking ideas, synthesizing understandings, and creating an authoritative space from which to make claims for action or understanding. Throughout this last section, I use 'constellations' of students' comments drawn from interview transcripts to help convey the dissensus and pedagogic subjectivation (Rancière, 2010) of students as they engage with my efforts to enact a negotiated grading contract.

The Emergence of Transformative Practice across Multiple Levels of Educational Practice

A central preoccupation in contemporary initial teacher education concerns introducing students to the discipline of teaching—provoking them, challenging them, training them how to perform and how to demonstrate the desired knowledge, skills and dispositions through forms of assessment. This purpose is distributed across multiple levels and interpenetrating systems that constitute teacher education (Ovens, Garbett, & Hutchinson, 2016). At the national level, the ethos that underpins a particular national or state education system influences the possibility for transformative pedagogy in practice and sits alongside the explicit policies and expectations for teacher professionalism. At the institutional level of teacher education (typically university settings), the collective constitution of programs, the forms of pedagogical experiences they enable, the subjectivities of all the participants, and the structure of relationships between all the participants affect the possibility of transformative pedagogy. The collective entanglement of these factors shapes the political and cultural arena in which a student's experiences and subjectivity are produced and positioned.

Given this, it would seem that the current neoliberal climate framing much of the education sector discourse, with its emphasis on standards, measurement and competitive individualism, would close down the opportunities for enacting forms of pedagogy oriented around issues of social justice, democracy and critique (Apple, 2006). While neoliberalism may constrain the possibilities of the system, however, it does not determine the outcome. As an example, the writers of the New Zealand Health and Physical Education curriculum moved physical education from a very technocratic conception to a position that favored a more socio-critical pedagogy (Culpan & Bruce, 2007; Ovens, 2010). Within this curriculum document, the themes of critical pedagogy, biculturalism, and social justice are significant driving themes that connect curriculum policy to school practices (Bowes & Ovens, 2010). As a result, Culpan and Galvan (2012) argue that New Zealand schools are expected to "reconceptualize their orientations in order to meet the new socio-critical thrust of which bi-culturalism is a unique, important and critical aspect" (p.40). Similarly, in their research, Abbiss and Quinlivan (2011) state that an important effect of having such a strong social-justice orientation in the New Zealand curriculum was that it, "was understood by teacher educators as a lever that could be used to advance social justice agendas, and by student teachers and teachers as supporting personal development and equity goals for learners" (p. 1).

Viewing curriculum practice across multiple levels should not be seen as a linear process linking policy to practice, since the way these levels interact and the mechanisms by which they operate should not be overlooked. Instead, seeing these levels as relational, networked and dynamic in nature is important. The overall effect of the above examples enables the transformative potential of teacher education practices being investigated in this study in two significant ways. The first is that the prior knowledge and beliefs that student teachers bring to teacher education are as a major influence on what and how students learn to teach. The idea that teacher education students draw on their own experiences of schooling and have already developed their own beliefs about education and teaching from school, friends, family and the media is strongly supported by literature (e.g., Velija et al. 2008). Thus, future students of teaching who emerge from critically-oriented school programs may be better able to problematize the subject area and engage with the emancipatory politics that structures their teacher education programs. The second factor concerns the schooling contexts and dispositions expected of them as teachers. Typically, a tension has existed between university and school contexts (Standal, Mordal-Moan, & Moe, 2014). However, when curriculum policy supports a critical orientation,

the possibility for a more consistent professional language and set of discursive practices between schools and university settings increases, and this consistancy will work to support the transformative aspirations of the teacher education program students are part of (Zeichner, 2010).

Reconfiguring Local Conditions to Enable Transformative Practice

At the individual course or module level, the way the pedagogy is configured governs the transformative potential of that course. In other words, the way a teacher structures the course and individual lessons will affect what and how learning emerges. Educational theory is not only the content to be taught, but also plays a key role in shaping the instructional practices and structures being used to teach the content. In terms of enabling transformative learning, Giroux (1994) identifies the difference between what he calls a *theory of pedagogy* and a *pedagogy of theorizing*. The distinction is subtle, but important. When the teaching in a course is oriented around a theory of pedagogy, the core ideas and concepts central to that pedagogy becomes knowledge to be learned or absorbed by student teachers and applied in school contexts. The implication is that, in the desire to enact a transformative pedagogy, theory becomes reduced to content taught through a transmission pedagogy where the teaching is either telling (the lecture), modelling (the demonstration lesson or microteaching), or guiding through apprenticeship (the practicum) (Ovens, 2013). In contrast, when the teaching in a course is oriented around a pedagogy of theorizing, the focus shifts to examining how the core ideas and concepts central to transformative practice become enacted within and lived through the instructional practices and structures of the course. This subtle difference in configuration leads to the emergence of different learning cultures and outcomes.

As Segall (2002) points out, the issue here is that, while teacher education students may be encouraged to ask critical questions *in* their teacher education courses, they are often not encouraged to ask the same question *of* their teacher education courses. For example, teacher educators encourage students to think about how teachers and schools meet the individual needs of their students, but rarely do they ask how their teacher education lessons meet student teachers' own individual needs. As Segall (2002) notes, if theory is not reflexively applied to understanding one's lived practice, the pedagogy involved becomes an exercise in separating theory from practice, while effectively disguising the process of doing so. By teaching a detached theory of social justice, power, oppression and privilege, students are anesthetized from challenging their own education and the methods used in their preparation programs. In this

way, theory is disconnected from everyday practice because it becomes content to be learned rather than lived (Segall, 2002).

In an attempt to enact a pedagogy of critical theorizing in my own practice, I significantly reconfigured two pedagogy courses I taught in the Bachelor of Physical Education (Secondary) Teacher Education Program. The aim was to develop a democratic form of teaching oriented around challenging students' deeply rooted familiarity with authoritarian teaching practice (Brubaker, 2012), while simultaneously encouraging them to engage with course experiences within the school and university setting that facilitated their professional learning. I began each year by inviting students to be co-contributors to the course design by discussing what learning was important to their needs, where and how such learning should occur, and how the outcomes should be assessed. These discussions typically explored a number of different ideas and approaches with the final outcome usually being a mixture of peer teaching, individualized negotiated grading contracts, and peer marking panels. Standards (as outlined in the university policy) and achievement expectations (in respect to my expectations for student learning) were made explicit, but they were offered as objects for discussion, interruption, and guidance rather than as linear goals to be achieved. All students were also allocated to one of six peer marking panels to assess and provide feedback on the negotiated work that was submitted to each panel, as well as provide another opportunity for students to experience and reflect an important aspect of pedagogical work. The final grades in each course were then determined by students submitting a portfolio of evidence self-assessed against the student's individual contract and moderated by me.

Reconfiguring the courses in this way is consistent with Biesta's (2006) complexivist idea of 'interruption,' in which students are challenged to work with new ideas and difference rather than focussing on achieving particular pre-set goals. It is also opens up the possibility for improvisation (Ricca, 2012) in the sense that students are encouraged to explore, create, and work with and embody their learning, while still being mindful of the standards against which their achievements will be assessed. The use of negotiated grading contracts (Brubaker 2009, 2012) provides a good example of the way orthodox practices of assessment were interrupted in the desire to exploit difference and improvisation in potentially creative ways for students' professional learning. In contrast to their other courses, students were asked to explain what they would do to earn a grade for my course, to what extent they would do it, how they would document and present their work, what criteria should be used to judge the quality of the work, and how such judgements would translate to a final grade. Guidelines were provided to assist students

with each of these decisions along with active discussions during the initial classes with each cohort. In this sense, each contract became an act of improvisation as it foregrounded the students' need for decision making in respect to the course goals and their individual aspirations and professional needs. The process of individual negotiation allowed for flexibility and difference, providing constraints that enabled students' spaces in-between the conventional to test the waters of power and responsibility for their own learning/growth (Brubaker & Ovens, 2012).

Dissensus and Pedagogic Subjectivation

To help make sense of the complexity, tangles, and texture of relations occurring at the students' level as they engage in activities like co-designing a course, negotiating a grading contract or marking their peers work, I draw on the work of French philosopher Jacques Rancière. Rancière is useful because he sees the mechanisms in operation in teacher education classrooms as processes of subjectivisation, an idea which sits in complete opposition to the more common Althusserian notion of interpellation. For Rancière (2010), instead of seeing any pedagogy as positioning, or calling students to, a pre-given ideological place, he argues that such a pedagogy reconfigures the relationships between doing, saying, and knowing in a way that displaces students into a particular political project. Such a reconfiguring can be unsettling. As my students experienced, it is a process that disturbs the status quo and displaces them into a place of possibilities.

> *We don't even know how to make our own contract. We don't know what a contract is, how we were supposed to make our own one… Being able to pick was really good, but to start with it was really quite overwhelming, yeah, that was just like my brain scattered, how do you start? …You are so used to being told what to do, you know, you have a lecture and they tell you, this is what the structure [is] and so for the first time it was kind of like, I get the onus for myself, I get to decide. It was just like whoa, okay….But the freedom within the assessments were a little bit too hard if you were given too much.. but once you really understood what you wanted to do, then it was quite good.*

Negotiating an individual grading contract is more than working with a new method of assessment. It is about disrupting the norms that govern teaching and learning. It is about provoking a moment of dissensus within the territory of the knowable, doable and possible. Students become unsettled in this activity because, as Rancière (2010) argues, the normal pedagogic logic is one of positioning students as ignorant and in need of instruction. Creating an opportunity for students to negoti-

ate their learning disrupts the consensus regarding the givens of the situation and simultaneously confirms and demonstrates the equality of a capacity: the intelligence as capacity to speak, to think, to act. It is unfamiliar for students to have this power.

> *I didn't think of the contract and I didn't see how much power I actually had to change it.... But I didn't think about it, you know, what if I challenge this, what if I want to do this, what if this happens. Because I just looked at the contract and signed it and marked it. But now if I was to go into next year of course I would have a larger understanding of what was, like the power that I have in this article…I liked how we had a bit more kind of free reign than with the other courses... it was really nice to get that chance to explore different assignments... and again to reflect on them building your own learning as a teacher...*

For Rancière (2010), the act of emancipation is the act of departure from the way in which one is assigned to a place in the social order, the act through which one disrupts the configuration in which one has a certain position and can see, say and do something.

> *I knew from the very beginning I wanted to put my own touch on it and my own flavour on it a little bit, keep it the same, but you know, I am an individual and that's one of the good things of the course, is we are individual teachers, and we are all 50 of us, or whatever, teach in slightly different ways because we are not all clones ...with our lesson we got to negotiate that as well because we had that...idea and it wasn't in the list of what we were given to do, we got to negotiate that purely just because we thought it would have been valuable ...it was a chance for us to explore other options you gave us...so in that way it was really nice to get that chance to explore different assignments, you could see what the assignments were about, what was required of you to do that, and again to kind of reflect on them building your own learning as a teacher in the way of negotiating...like...due dates...*

According to Rancière, individuals or groups undergo subjectivation when they refuse to believe that the only way things can be is how they currently are, and when they demonstrate their capacity to link 'what is' to 'what could be' (Bastrup-Birk and Wildemeersch, 2013). In the case of negotiating grading contracts, the process legitimizes the expectation that student teachers are capable of conjuring up novel principles and modalities for governing their own professional learning. This requires students to harness their own capacities, become aware of their potentiality for bringing to the fore alternative, distinctly different ways of thinking about a particular problem in common. This is not easy after a history of stultification.

…my initial thought was...confusion of not knowing whether we were meant to see our grades first and then work towards it or create it and then sit our grade on the final outcome of what we've done, so that's like yeah I'm still not 100% sure on that one, but apart from that being able to choose everything I really, really liked that… I was just like, yeah, very overwhelmed with kind of like, what exactly … I think it was more because I was asking myself what are you asking of me, instead of what am I asking of myself.

Pedagogic subjectivation implies that individuals and groups are enabled to question the prevailing ways of being, seeing and saying. What must emerge is a desire to question assessment practices and willingness to challenge the intentionality inherent in pedagogy as a vehicle for incorporating stock knowledge and particular values of being teachers. Responsibility surfaces here as the ability or opportunity to make decisions and/or to act independently without authorization *…as teachers, we are going to be held responsible and accountable for things like due dates and that type of thing. So maybe when that came to giving us the actual assignment or for us to actually look at the contracts, we would have been like oh, well I do need to take responsibility for this, because I will be a teacher in the coming years.*

Commitment, meaningfulness and ownership emerged for some as a progression branching from responsibility, stepping deeper into new possibilities. *So we'd been involved with the process of choosing what kind of things we wanted to look at and how we were going to look at it. It had mixed results I think. I think the whole underlying idea was to move the responsibility and, not responsibility but you were supposed to take ownership of the things you did and it was supposed to be towards yourself but I think that, that kind of got lost for a few people because it was such a new way of giving a paper ...most of the other papers... have been very prescriptive... and we are used to that. We aren't used to taking ownership of [our] own learning… It gives you more of an ownership over your own learning...*

Some Final Remarks

As stated previously, my aim in this article was to use a complexity-based approach to examine the multi-layered acts of professional learning and assessment that provide a means for enacting transformative pedagogies in teacher education programs. In general, each effort to enact a transformative pedagogy as a form of professional learning emerges from within a particular political and cultural arena where forms of student experience and subjectivity are produced and mediated in ways

that enable students to engage in critical activities that may challenge the status quo, reconstruct social-political-historical knowledge, question dominant ideologies and make public the histories of those marginalized, disenfranchised and/or disaffected. A very similar conclusion was reached by Gerdin, Philpott and Smith (2016) who also studied students involved in the same programme as this study, found that the particular configuration of factors in the degree program, including student expectations, the nature of school mentoring, the orientations of the teacher educators, the research culture of the university, all collectively created a programmatic culture that could "plant 'seeds' that had an impact on the graduate teachers' awareness and thinking about socially critical issues in relation to physical activity and health" (p. 1). In addition, as this analysis has attempted to highlight, it is rarely possible to succeed in enacting a transformative pedagogy in teacher education when the teacher educator works alone. Likewise, the ability of programs to be transformative is rarely mono-causal (Mordal-Moen & Green, 2012). Improving the possibility for transformative practice appears to involve attending to the creation and sustenance of social systems operating at different levels of the education system as much as it does on using particular methods and strategies in teacher education lessons (Lorente & Kirk, 2013).

Using complexity to think differently is an acknowledgement that teacher education is a setting where the practices of teaching must be interrogated, particularly as they shape, produce, and challenge student subjectivities and experiences central to working in contemporary schooling contexts, and that are themselves implicated in the social and the political of life in modern society. Importantly, the social and political are present in all pedagogies, since the particular configuration of any system not only connects them to the broader socio-political world, but also works simultaneously to make them seem natural, the linear product of rational decision. Thinking of teacher education as complex requires an understanding of factors that work in non-linear ways. These factors are best thought of as multiple, recursive, and dynamic, with each operating at different levels and scales in the education system to create the constraints and enabling elements that shape a set of practices being enacted with pre-service students of teaching called teacher education.

Acknowledgement

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