Chapter 3
Directing the Action: Learning to Focus on the Self to Develop My Pedagogy of Teacher Education

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Many have likened teaching to a kind of performance and drawn from theatre literature to explore the intersections between acting and teaching. In this chapter I will explore the potential value of the art of directing for understanding transitions in my development as a teacher educator. I have structured this chapter in an atypical fashion in keeping with a concept that has resonated with me since my physics curriculum methods course with Tom Russell: Experience First. A sign posted at the front of the classroom alerts teacher candidates to the phrase, but more importantly, Tom provides opportunities to "experience first" by engaging candidates with interactive science demonstrations known as P.O.E.s (Predict-Observe-Explain) right at the beginning of the first class. The course is heavily weighted at the beginning toward creating shared learning experiences with science through microteaching and group investigations through open-ended labs; towards the end of the course Tom spends considerable time working with candidates to name the major theoretical themes that have resonated with the group throughout the year. Bullock (2011) provides a description of this process. The idea of *experience first* provided me with my first metaphor for thinking about transitions in learning about teaching, learning to teach, and learning to teach teachers. It also helped me to make sense of the role of cooperative internships in how I learned during my undergraduate physics degree.

In keeping with the importance of *experience first* for understanding my transitions from teacher candidate to teacher to teacher educator, I begin with a narrative account that includes excerpts of data from published studies with a view to identifying "turning points" (Bullock and Ritter 2011) in which I came to understand my pedagogy, my identity, and/or my professional knowledge differently as a result of

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studying my practice. I then turn to an articulation of the theoretical frameworks that have guided my thinking as a teacher and teacher educator. Moving from a narrative account of my experiences to my theoretical orientations is in keeping with my fascination with the concept of "experience first," which I first articulated as a teacher candidate and as someone enrolled in a unique dual-degree co-operative program as an undergraduate student. The chapter will conclude by unpacking a conceptual metaphor developed from theatre literature, *directing the action*, as a path forward for developing new knowledge about my pedagogy of science teacher education.

I acknowledge that *directing the action* might not be a familiar metaphor. To provide some additional context for reading the narratives, I encourage readers to first consider the ideas and images that leap to mind when they think of a "director" of stage or film. Directors might be thought of as the people who put productions together. The Directors Guild of Canada website (http://www.dgc.ca) makes it clear, for example, that there are both creative and logistical aspects to being a director. The popular Internet Movie Database defines a director as "the principal creative artist on a movie set" (IMDB 2015). The American Association of Community Theatre states:

> The work of the director is central to the production of a play. The director has the challenging task of bringing together the many complex pieces of a production—the script, actors, set, costuming, lighting and sound and music—into a unified whole . . . . this sense of "what the play is really about" will shape a director's thinking about every other aspect of the production. (American Association of Community Theatre 2015)

At the end of the chapter, I will invoke a particular way of thinking about the art of direction as a framework for thinking about transitions in teacher education. For now, I encourage readers to think about ways in which I might have directed my development as a teacher educator through these transitions, and the inherent tensions in directing one's own story. As Marowitz (1986) suggested, we will see that the concept of directing – theatre, film, or, for the purposes of this paper, one's development through transitions in thinking about teaching – requires one to understand the importance of collaborating with others while maintain a particular authorship of one's work. In the case of developing as a teacher educator, I would argue that the metaphor of direction allows me to think of my role in authoring my own experiences. The story of my experiences for this chapter is now presented using the subtitle of a classic work of fantasy fiction.

There and Back Again: Physicist, Teacher, Teacher Educator

"There and Back Again" is the subtitle for J. R. R. Tolkien's (1937) beloved classic, *The Hobbit*. The story, as many readers will know, centres on Bilbo Baggins, a small human-like creature called a "hobbit" who lives a quiet life in an idyllic place called The Shire. One day, a wizard named Gandalf shows up with a group of dwarves to

convince Bilbo to join them on a dangerous quest to rescue dwarven treasure from the Lonely Mountain. Securing the treasure requires Bilbo and his companions to deal with all manner of fantastical beings: trolls, giant spiders, shape-shifters, elves, and, of course, a dragon named Smaug. The story concludes with Bilbo's return to the Shire, both with a small share of treasure and, more importantly, a worldview forever changed by the gravity of events he witnessed in the world of Middle Earth: battles, betrayal, compassion, reconciliation, and heroic actions linger in Bilbo's mind and set the stage for the next series of Tolkien stories.

I invoke the story of *The Hobbit* because I have always enjoyed the fact that Bilbo returns home to live out his intended life after his fantastic adventures – a choice not often made in the world of fantasy fiction. He changed, but he also knew where he wanted to spend his time, even if he seemed to wonder if he will ever truly process the magnitude of what happened to him. The subtitle *there and back again* seems to be an appropriate metaphor for the changes, transitions, and transformations that I have experienced in my career. I remember discussing university in somewhat abstract terms when I was still in elementary school; my parents and grandparents' emphasized post-secondary opportunities as a place where one could pursue a particular interest. I had vague notions of pursuing the physical sciences or engineering from a relatively young age – largely motivated by a fascination with astronomy and an obsession with Isaac Asimov's robot novels. I remember visiting an open house at the University of Toronto with my parents early in my grade 11 year (2 years before I had to apply under the old Ontario 5-year secondary school system). I wish I could remember the name of the physics professor that we met that day. In response to my question about the pros and cons of studying physics at large and small institutions in Ontario, he gave us an incredibly honest answer: "You're going to get a good education at any university in Canada. You just need to find the one that feels like the right fit for you." I remain deeply impressed with the fact that he did not respond with a sales pitch for physics at the University of Toronto. I spent the next 2 years devoting a considerable amount of time to researching the various options I had for studying in Ontario, relieved of the burden of making a "wrong" decision. I figured out that my firmly entrenched adolescent interests in astronomy and cosmology meant that physics was a more appropriate choice than engineering. Experiences in a co-op French teaching assistant program in secondary school confirmed my interest in teaching.

Act I: Janus-Facing Disciplines

My plan in my final year of secondary school was to obtain degrees in physics and education, teach at secondary school for a few years to develop skills as a teacher, and then return to school to pursue physics and secure a teaching position at a local university. What makes these goals somewhat odd is that I am the first person in my immediate family to attend university. I made plans with no sense of what the life of a professor was or, to be honest, what learning at university would entail. I am not

sure why I knew I wanted to teach at university, but I assume it was because I liked the idea of focussing on one discipline and doing research. Perhaps my adolescent goals were part of a self-imposed responsibility to make the most of the opportunities that I had. Perhaps I thought university was the only place where I could pursue things I was interested in in-depth. Whatever my reasons, I enrolled in the co-operative physics program at the University of Waterloo in Fall 1995, with the plan of applying for admission to the concurrent education program offered through a partnership with Queen's University the following year – a program that would enable me to graduate with a B.Sc. and a B.Ed. in 5 years with significant work experiences in both the sciences and education. To put it mildly, I was excited and a bit overwhelmed.

I outlined my early experiences thinking about my career in education because it reveals the complicated nature of my conception of "home." I have always had one foot firmly planted in the physical sciences and the other foot firmly planted in education – a situation perhaps best evoked by representations of the Roman God Janus. My undergraduate experience wove the two disciplines together in a way that is rather uncommon: I completed my coursework in education at Queen's halfway through my physics degree and returned to Waterloo for third and fourth year studies. I had both technical and educational co-op internships. Thus the "back again" metaphor, for me, always means a return to both physics and education. My dual-degree undergraduate experience was a significant prompt for me to consider the nature of professional knowledge: – I learned how to learn from experiences in both disciplines and, perhaps most significantly, I learned how to monitor the quality of my learning in both disciplines.

Act II: Learning to Think About Teaching as a Teacher Candidate

Most students entering teacher education programs in Ontario come straight from a completed undergraduate degree program. At the time, programs were roughly 8 months and featured a familiar mixture of coursework and field experiences. Many teacher educators told us about the important difference between a "student teacher" and a "teacher candidate" – we were to think of ourselves as candidates for entering the profession, and to act accordingly. The fact that there were many times during the B.Ed. program devoted to interview skills, job fairs, and the requirements to apply for certification by the Ontario College of Teachers added to the zeitgeist of "entering a profession." For me, things were slightly different: I was younger than most of my peers, I had only completed 2 years of an undergraduate degree, and I had to return back to University of Waterloo to complete my physics degree after completing the B.Ed. program. I did not have to worry about finding a job for at least 2 years. I believe that my transition into being a teacher candidate was a bit different from my peers because I did not experience the pressures of finding a job

during my B.Ed. year. I transitioned into being a teacher candidate, but I also knew that I would have to transition back into being an undergraduate physics student.

It is difficult to overestimate the effects that my experiences as a teacher candidate in Tom Russell's physics curriculum methods class at Queen's had on my development as a student, a teacher, and a teacher educator. With considerably embarrassment, I recall that I was, like many with initial training in the physical sciences, initially sceptical about the degree to which courses in education might engage me in rigorous intellectual work. A part of my scepticism was due to the fact that I had a sense of what the discipline of physics was, but I had little idea of what education was beyond the importance of practical experiences. I did not know what to expect from coursework in education – some lessons from psychology, perhaps?

Tom's class quickly showed me that thinking about education could be every bit as rigorous as thinking about physics. I still remember enjoying being caught up short during our first Predict-Observe-Explain (Baird and Northfield 1992) activity on the first day of class – my knowledge of physics was not as strong as I thought it was. I was pleasantly astonished when we were given the change to create our own assignments *in a university course* so that we could pursue questions of interest. I also learned that education, like physics, generated knowledge through research. We were required to conduct an action research project in our program; I used the opportunity to explore the idea of teaching science through inquiry (what I called an "experience first" approach at the time) – an idea that I learned in Tom's class. He helped me develop the action research project into my first journal article (Bullock 1999), a considerable source of pride for an undergraduate student.

My sense of education as a discipline developed further when Tom invited me to co-author a chapter with him as a result of our email correspondence during my time as a student in his course. I was both surprised and excited by the suggestion and I thoroughly enjoyed my working closely with Tom, but it was not until several years later that I realized the chapter was my introduction to studying myself. Loughran (1999) noted in the first chapter of the edited volume in which our chapter appeared:

> Much of my knowledge about teaching and learning was tacit and therefore implicit in my actions as I was rarely required (or encouraged) to make it explicit through articulation – to myself or to others. In retrospect I sometimes wonder what I thought researching teaching might have meant or what it might have involved. (p. 1)

Loughran's comments underscore my good fortune as a teacher candidate: By working with Tom on a chapter devoted to exploring features of Tom's teaching and my learning in his course, I was provided with a powerful early lesson in the importance of making my tacit knowledge "explicit through articulation" to both myself and to others. I argued that keeping a journal of my teaching experiences to share with Tom had the following benefits:

1. *A Journal of Experience*: "Each time I look at my notes, the experiences I had in the classroom rush back to me" (Russell and Bullock 1999, p. 134).

2. *Positive Reinforcement and Encouragement*: In response to my apprehension at teaching a math class that followed a different curriculum from the one I was familiar with as a student, Tom said: "I think being nervous in a situation like this is incredibly positive and important. There would be something wrong if you weren't nervous. You KNEW that there was much to learn, and much that could be unpredictable" (p. 136).

3. *Issues are Explored and Revisited*: "Many things happened during my practicum to inspire me to think, and there are many teaching issues that cannot be 'answered.' Instead, they must be constantly revisited, which is something I hope to do in the future" (p. 136).

4. *An Exercise in Metacognition*: "One of the themes I took back from the on-campus weeks was Tom's statement that 'How we teach IS the message.' I feel that by engaging in metacognition during my practica, I can learn from EXPERIENCE how to encourage students to think about their learning" (p. 137).

5. *Pedagogical Sounding Board*: Tom helped me to clarify some of my views in my nascent pedagogy of science education devoted to providing students with inquiry experiences: "In one [journal] entry, I hypothesized that the ability of Grade 12 students to function in an 'experience first' approach might be due to the fact that they were used to a very structured approach to labs. I felt that this comfort level could allow them to function independently. Tom asserted that there was a difference between 'experience first' and 'functioning independently'" (p. 138).

6. *More Questions*, *Deeper Meanings*: "Tom was adept at not giving 'the right answer' on issues and opinions that I raised . . . . Instead he would ask more questions to help me reflect on a deeper level and get to the heart of the matter" (p. 138).

Although not explicitly framed as such, the chapter is an example of a collaborative self-study. The first half of the chapter presents the insights I gained into my teaching (during practicum placement) as a result of Tom acting as a critical friend (Costa and Kallick 1993), while the second half of the chapter presents how Tom viewed his pedagogy of teacher education differently as a result of my comments on his class. Significantly, we used the same headings (listed above) as an organizing framework for Tom's thinking. The result, we felt, was a productive experience that offered an important way of researching teaching. In conclusion, we acknowledged the riskiness of our endeavour:

> We realize that a shared dialogue such as this involves risks and trust, trust in each other as well as the process to which we committed ourselves. We recommend such dialogue to others willing to take similar risks to overcome the invisible and private nature of most teaching and thinking about teaching (Russell and Bullock 1999, p. 150).

My introduction to thinking about teaching and learning culminated in a piece of research that articulated not only what I learned from a professor who I respected, but also what he learned from me. I learned about the value of having a trusted critical friend to help me unpack and articulate what I learned from professional experiences. In short, I learned to *direct the action* of learning about teaching.

I returned to Waterloo to complete my physics degree in May 1998, profoundly changed. I had transformed into someone who had a language for talking about issues of teaching and learning. I was far more aware of how I was (or was not) learning and I paid attention to some of the problematic aspects and interesting opportunities of undergraduate physics education. As a result of my time at Queen's and my time studying with Tom in particular, big questions in education interested me more than big questions in physics. My future gaze shifted toward graduate study in education rather than physics.

Act III: Early Experiences in Education, Becoming an Educationist

After graduating from both programs in 2000, I officially changed into a teacher. The statement is somewhat tongue-in-cheek, as I believed that my teaching mindset had developed upon finishing the Queen's program 2 years earlier. I completed my two remaining co-op internships in educational environments: one in a mixture of elementary and secondary school settings focusing on science and technology education, and one in a tutoring centre at a large community college. In many ways, though, I did not feel like a "real teacher" until I walked across the stage at convocation and when I received my certificate of qualification from the province a few weeks later. I was excited to finally transition into my new professional role: I would have my own students, my own classroom, and the ability to teach in whichever ways seemed best to me at the time. It was not long into my new career, however, that I sought ways to engage with professional and academic communities, to think about what others had written about teaching science, and to formally investigate my practice. I was motivated both by a desire to improve my practice and to manage the often turbulent waters of the first years of teaching.

I began my career in education as both a secondary school physics teacher and a part-time college physics instructor. I maintained both roles due to the ever-present concern of losing my teaching job due to low seniority during a time of restructuring in my school district. In 2003, I switched school districts to become an in-school "literacy teacher" consultant to a family of schools, while maintaining my role at the college. I began a master's degree part-time with Tom in 2002. In 2005 I left my full-time teaching positions to pursue doctoral work with Tom full-time. During my second year of full-time PhD studies, I had the opportunity to write a chapter that unpacked much of what I learned during my five years as a classroom teacher and in-service teacher educator (Bullock 2007). In particular, this work helped me to understand why my experiences as an in-service teacher educator from 2003 to 2005 did not quickly and un-problematically translate to my new role as a preservice teacher educator and doctoral student. Again, Tom challenged me to write about what I was noticing in my work with teacher candidates, and how this work differed from my prior work with experienced teachers.

Bullock (2007) serves as the next important touchstone in the development of my understanding of the nature of professional knowledge for a number of reasons. First, it was an opportunity to synthesize what I had learned about teaching and learning from 5 years of professional experiences in K-12 and college education. Second, it allowed me to describe and interpret my first experiences as a teacher educator in the first year of my doctoral program – I co-taught Tom's courses in the first semester of my doctorate and taught them on my own during his sabbatical leave in the winter semester (Bullock and Russell 2006). Third, it marks the first time I made links between Schön's (1983) work and self-study of teacher education practices (S-STEP) methodology. Although I did not engage deeply with the methodological literature in this instance, I took the challenge of self-study to heart and developed a series of problems to challenge myself to understand the nature of my teaching. I noted:

> My research questions were influenced by Tidwell's (2002) caution against investigating characteristics of practice before finding out if one's practice is enacted in the way it is intended. Instead of asking, for example, *how* I solicit teacher candidates' prior conceptions of their pedagogy, I asked *if* I solicit candidates' prior conceptions of their pedagogy. There is an important distinction between the two questions, namely that the second question does not involve *a priori* assumptions about the characteristics of my teaching (Bullock 2007, p. 87).

Most importantly, this process was the beginning of my use of self-study to make sense of the transition from teacher to teacher educator. I admit that, at the time, I rather naively assumed that writing the chapter would be "the end" of my need to make sense of this transition. In addition, I also assumed that the challenges of moving from teacher to teacher educator were unique to me and of little interest or epistemic import to the community as a whole. I felt that self-study was a useful methodological tool for me to make sense of important events in my development as a new academic. Little did I know that my early work in self-study would form a habit of inquiry later in my career, or that I would eventually attempt to make contributions to methodological questions about self-study. Throughout my doctoral work, I maintained a dual focus on my interest in the problems of (science) teacher education and an interest in self-study research. A publication with a fellow doctoral candidate and ongoing colleague (Bullock and Christou 2009) cemented my confidence to use self-study as a tool for understanding interesting problems of pedagogy that I was experiencing in my early career – in this case, the role of foundational courses and practicum experiences in teacher education.

Act IV: Early Academia; The Turn Back to Science

My initial position at a university that self-identified as an "institute of technology" thrust me into the problematic role of an academic who, while personally enthusiastic about digital technology, was highly sceptical of the possibility of digital technologies to stimulate significant change in teacher education. I decided to again rely

on self-study methodology to help me interpret and challenge what "digital pedagogy" might mean in my new role. I concurrently realized that the idea of *becoming* a teacher educator was a process rather than an event and that I had much more to learn about teaching future teachers. In Bullock (2011), I commented on what I learned from my first 2 years as an academic, trying to fit in with institutional mandates to explicitly use technology in my teacher education courses. I was concerned with the somewhat atheoretical way in which much technological "innovation" seems to occur in education, a tension that I named *architecture is not enough*. In the conclusion to the article, I noted:

> Having the appropriate hardware and software tools at my disposal does not automatically mean that I taught from a theoretical framework about digitally enhanced pedagogy. I was, unfortunately, initially satisfied with very superficial approaches to using technology in my classroom. My needs changed in my second year of my appointment at UOIT. I wanted to make use of digital tools for the pedagogical purpose of enhancing my relationships with students. The blogging assignment's success in opening up possibilities for communication and relationship building might be considered within the theoretical framework [of networked publics] offered at the beginning of this paper. (Bullock 2011, p. 103)

During the third year of my appointment as an assistant professor, I returned to graduate school part-time (and post-PhD) to study the history and philosophy of science (HPS) at the University of Toronto. There were many reasons for this endeavour, but it was mostly because I wished to understand further what Schwab (1978) would have referred to as the syntactic structures of my cognate discipline of physics. In hindsight, I wonder if my extended time away from working explicitly with concepts in physics made me feel somewhat unbalanced. Regardless, my M.A. work in HPS provided me with a new lens with which to think about how I teach about teaching science and how I think about the role of self-study in science teacher education. In my introduction to an edited book on the intersections between science education and self-study, I drew on Shapin and Shaffer's (1985) influential work in the history of science to make the argument that self-study was an often-overlooked source of knowledge about science education:

> If we return to the three technologies (physical, literary, and social) used by Robert Boyle to usher in his experimental approach to science, we begin to see some of the problems associated with excluding, by accident or design, the voices of science teacher educators as practitioners of science teacher education pedagogy. Boyle's physical apparatus—the air pump—has as a modern analogue the physical data collected via quantitative and qualitative research traditions. The literary technologies are alive and well in the academy in the form of scientific journals, books, conference papers, and technical reports. It is the social technology, however, that is of particular relevance to this discussion. Academic discourse clearly has a set of social norms and patterns that encourage the analysis of research findings and construction of scientific knowledge. Until the self-study of teacher education practices movement, however, the voices of teacher educators, those who teach future teachers, were largely silent on important issues such as the way they enacted particular pedagogical approaches, the tensions they felt as they attempted to live particular values in practice, and the development of professional knowledge of teacher educators. (Bullock 2012a, pp. 4–5)

My work in HPS has led me to a new line of thinking: examining the ways in which physicists of historical note thought about pedagogy, and considering what idea(s) their insights might have for thinking about my practice and for science education as a whole. With this renewed engagement with physics, I indeed find myself "back again," with a foot in two disciplinary worlds, after having gone "there" to become an educationist and academic.

Theoretical Frameworks

My narrative is firmly grounded in Schön's (1983, 1987) epistemology of learning from experience. I share his critique of the (sometimes tacit) technical rationalist underpinnings of most approaches to professional education and I have based much of my work on the importance of identifying moments of "reflection-in-action" that have led me to reframe my pedagogy and scholarship. Schön (1983) argued that the unique combination of the emergence of the North American style of universities in the late nineteenth-century and the rise of Positivism resulted in "the very heart of the university was given over to the scientific enterprise, to the ethos of the Technological Program, and to Positivism" (p. 34) – particularly in the United States and Germany. The result was that, in a relatively short time – just a few decades later:

> The prestige and apparent success of the medical and engineering models exerted a great attraction for the social sciences. In such fields as education, social work, planning, and policy making, social scientists attempted to do research, to apply it, and to educate practitioners, all according to their perceptions of the models of medicine and engineering. Indeed, the very language of social scientists, rich in references to measurement, controlled experiment, applied science, laboratories, and clinics, was striking in its reverence for these models (pp. 38–39).

Munby et al. (2001) review of the literature on teachers' professional knowledge and how it develops argued that this kind of thinking is what gave rise to arrogant presuppositions that the role of teacher educators is to simply tell teacher candidates how to teach; that is, to give them ideas that they enact during their practicum placements. This underpinning of technical rationality misunderstands the nature of the development of professional knowledge as problem solving, which Schön articulates in the following way:

> Although problem setting is a necessary condition for technical problem solving, it is not itself a technical problem. When we set the problem, we select what we will treat as the "things" of the situation, we set the boundaries of our attention to it, and we impose upon it a coherence which allows us to say what is wrong and in what directions the situations needs to be changed. Problem setting is a process in which, interactively, we *name* the things to which we will attend and *frame* the context in which we will attend to them. (Schön, p. 40)

This interaction between naming and framing, which Schön calls *reflection-in-action*, is what leads to the development of *knowing-in-action*, which according to

Schön is the *characteristic* kind of knowledge that a professional develops. Thus there is inherent artistry in the development of professional knowledge, since the problem of setting is, in Schön's terms, not a technical problem and therefore not conducive to scripts or pre-arranged ideas. A situation encountered by a professional is likely to have any number of possibilities associated for problem setting; it is up to the professional to determine the nature and scope of the problem that requires action.

Self-study methodology is closely linked to many of Schön's ideas; the connection is perhaps strongest when one considers that both sets of ideas frame professional knowledge as complicated, messy, and largely tacit. In the inaugural issue of the flagship journal of the field, *Studying Teacher Education*, Loughran (2005) reminded researchers that the "self" refers to the fact that self-study focuses on the improvement of our own teacher education practices, and it does not mean that it is a solipsistic endeavour. Thus I see self-study methodology as a way for me to apply Schön's ideas about the nature and development of professional knowledge to considerations of my own practice. I frequently cite LaBoskey's (2004) five criteria for self-study research design as crucial to my thinking: Self-study research is self-initiated and focused, improvement-aimed, uses interactive, multiple, primarily qualitative methods, and employs exemplar-based validation (pp. 842–852). I also take seriously Pinnegar and Hamiton's (2009) assertion that, when it comes to self-study research, "the basic question has always been more about *what is* than about claims to know," which further implies that "ontology, rather than epistemology [should be] the orienting stance in S-STTEP research" (p. 8).

I frequently work with critical friends in different disciplines (e.g., Fletcher and Bullock 2012), the same discipline (e.g., Bullock et al. 2014), and within the same institutional context around a shared programmatic interest (e.g., Ling and Bullock 2014) to help me understand how I "set" my problems and to challenge me in ways that help me frame problematic features of practice differently. Working with critical friends has taught me a lot about self-study as methodology and, in particular, the value of what LaBoskey (2004) refers to as "assumption challenging":

> To influence practice we must transform teacher thinking, but this, for a variety of reasons, is easier said than done. For one thing, our beliefs, values, and knowledge of teaching are derived from our experiences – our personal histories, which are necessarily limited and variant. In addition, many of these assumptions are implicit; they have never been articulated even to us. What is more, some of these ideas are deeply held and intimately connected to our identities as teachers and learners. (LaBoskey 2004, p. 829)

It is perhaps a consequence of this focus on "assumption challenging" that I have recently explored both life history approaches and perspectives offered by theatre literature (Johnstone 1979; Marowitz 1986) to inform my development as an education professor. In Bullock (2014a), I developed a life-history approach based on the development of "episodes" to explore 30 years of involvement in a variety of martial arts – a significant, non-formal educational experience in my view – on my pedagogy of teacher education. I drew the following conclusions from that study:

1. There is considerable value in re-experiencing oneself as a learner by examining one's own life history in order to challenge how we know what we know about teaching. My experiences as a martial arts student have direct relevance to how I think about teaching teachers.
2. If we accept the idea that prior experiences as a student and as a teacher influence our work as teacher educators and professors of education, then our prior experiences as a learner in non-formal settings offer a rich context for additional analysis through self-study (Bullock 2014a, p. 114)

In Bullock (2014b), I use the concept of *status* from Johnstone's (1979) treatise on improvisational theatre as a lens for analysing a 15-min discussion during a video-recorded meeting of one of my physics courses. Improvisational theatre provided a significant, novel, window into understanding how I work with future science teachers by highlighting the ways in which I tacitly raise and lower my status during discussions to facilitate learning. This self-study work has encouraged me to develop further my scholarly interest in, and practice of, dramatic arts – a pursuit that I will be formally engaging with in coming years.

Developing a Distinct Pedagogy of Teacher Education

Frequently there have been calls for a knowledge base for both teaching and teacher education. I prefer to think of my contributions to the field as helping to establish self-study as what I refer to as a "basis-for-knowing" (Bullock 2009) rather than a knowledge base about teaching future science teachers. Generally speaking, science education tends to spend a lot of time focusing on the importance of content knowledge and pedagogical content knowledge. Although these two forms of knowledge are important, they are propositional. Self-study has provided me with a way to articulate knowledge gained through careful analyses of experiences as a science teacher educator.

There are two major themes that I continually return to in my scholarship of self-study: the importance of naming and challenging prior assumptions and the value of enacting pedagogical approaches grounded in developing relationships with teacher candidates. In my first self-study paper I explored the challenges afforded by teaching the second half of my supervisor's physics methods course. I quickly discovered that many of my assumptions about teaching future teachers were grounded in the two years previously spent as an in-school teacher consultant for a large secondary school in Ontario. I did not understand the degree to which these assumptions affected my pedagogical approach until they were named and challenged in a productive way by my supervisor (and critical friend). Since that paper, I have worked hard to name prior assumptions that I have about any novel situation I encounter in teacher education – a new course, a new pedagogical approach, or a new institution. The overarching theme to most of my work is the importance of developing a relationship with teacher candidates that encourages them to develop an "authority of experience" (Munby and Russell 1994) over events in their teacher education pro-

grams. Recently, I have explored the potential of a variety of digital technologies to help candidates develop their authorities of experience.

In Bullock (2012b) I introduced the idea of developing a distinct pedagogy of teacher education, where distinct is not a synonym for *discrete* or *different*, but instead "I frame the idea of distinct as a *clear, unmistakable impression*. Thus a distinct pedagogy of teacher education recognizes the effects that problems of practice have on one's prior assumptions and principles" (p. 118, emphasis added). At the time, I did not have the conceptual tools to unpack further the consequences of this idea. Here, I turn again to theatre literature to shed further light on my professional development as a teacher educator.

Lakoff and Johnson (1980) argued that the ways in which we use conceptual metaphors reflect our underlying thought structures. In their canonical example, they invoke the language of argumentation (e.g., to "win" or "lose" an argument, to "have a fight") to illustrate that many people have a tacit conceptual metaphor of *argument is war* that reflects how they behave in disagreements. I wish to invoke a conceptual metaphor from theatre that reflects how I think about my development as a teacher educator and scholar: *directing the action*.

In his book *Directing the action*, Charles Marowitz (1986) argued that directing theatre requires one to metaphorically wield a staff like Prospero in *The Tempest*. In so doing, the modern director is free to "muster bright and dark spirits into their service to create theatre," the "rough magic" that "must ultimately be abjured" in favour of an ultimate collaboration with fellow artists (p. xviii). Regardless of a director's intent to work collaboratively, bring out the best in others, and enter into a wider conversation with the audience, she or he must first summon seemingly magical emotive forces that serve both as a catalyst and a starting point for theatre, assuming a "lofty vantage point" associated with the image of director as an authority figure. The end result, according to Marowitz, is that "the director abdicates in favour of that new authority – the public" (p. xviii). Self-study methodology has acted as a kind of rough magic that catalyzes new inquiries into my practice, which I am unable to fully understand until I negotiate a variety of vantage points on my practice including literature, critical friendship, and the voices of my students. In this way, my development as a teacher educator has been a process of learning to *direct the action* through self-study methodology. I must negotiate the inherent tensions in setting and maintaining a course for my work as a teacher educator while simultaneously opening myself up to ideas offered by critical friends and by the literature. As Marowitz states:

> The modern director, then, is not simply a person who imposes order upon artistic subordinates in order to express a writer's meaning, but someone who challenges the assumptions of a work of art and uses mise-en-scène actively to pit his or her beliefs against those of the play. Without that confrontation, that sense of challenge, true direction cannot take place, for unless the author's own work is engaged on an intellectual equal to its own, the play is merely transplanted from one medium to another . . . . A performance that is not suffused with new dynamics proceeding from other temperaments and other viewpoints contradicts the essence of the word *perform* – which is "to carry on to the finish," to "accomplish," to fulfill the cycle of creativity begun by the author. (Marowitz 1986, p. 6)

This conceptual metaphor seems particularly appropriate to my journey as a self-study researcher because it acknowledges characteristics inherent in the methodological approach and to how I function as a scholar. In the first case, both LaBoskey (2004) and Bullough and Pinnegar (2001) have argued that self-study uses multiple primarily qualitative methodologies and, in so doing, imports the requisite criteria for trustworthiness and rigour. Like a director, called to fulfill a cycle of creativity, a self-study researcher needs to both assemble a performance (in the form of a final product for research purposes) from what is available while challenging her or his prior assumptions. To be a new basis-for-knowing, a new understanding of ontology, a piece of self-study research needs to be a *performance* in Marowitz's sense of the term. In the second case, the disciplines in which I plant my feet – physics and education – provide a sense of confrontation in my academic self that may require me to direct my actions in particular ways once I realize the tensions I experience.

This chapter has provided an overview of my professional development as a teacher and as a teacher educator. In many ways, this overview has underscored that an important element of my professional development has been to learn to focus on my *self*, a self productively understood within the context of self-study methodology. I began this journey as a physicist and an educationist; my academic position and my professional certifications as a teacher and as a physicist reveal that I am still grounded in these two perspectives. Yet throughout my experiences of professional and intellectual transition over the past 20 years from undergraduate student to education professor, I have learned the importance of making my tacit knowledge explicit through self-study. I have learned the importance of *directing the action* of my professional development through challenging my prior assumptions through critical friendship and through examining my life history. Looking forward, my current position at a Faculty of Education that prides itself on encouraging interdisciplinary approaches? enables me to feel free to pursue literature from the performing arts as a way of further challenging and developing my understanding of science teacher education. I look forward to the new challenges of understanding my evolving performance as a teacher educator.

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