Framing learning through self-study: The search for pedagogical equilibrium

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As a secondary science teacher and, more recently, a science teacher educator, I (first author) often found it difficult to articulate and discuss the reasons for my actions and teaching decisions with my students of teaching. I searched for ways of coming to better understand the complexity of decision making processes and how to work effectively within them to benefit my students’ learning. As I have learnt to purposefully inquire into my practice I have become increasingly aware that my role as a teacher of teachers requires me to manage dilemmas. Teaching then involves being a ‘dilemma manager’ (Lampert, 1985); an important issue in conceptualizing and framing teaching and learning about teaching.

Dilemmas usually signal feelings of uncertainty, perplexity, doubt or confusion. When acted on, it can invite the process of problem setting (Dewey, 1938), reflection and inquiry, leading to reframing through which a ‘conversation’ with the problem occurs (Schön, 1983).

Different frames for problem recognition, such as dilemmas (Cabaroglu & Tillema, 2011; Tillema & Kremer-Hayon, 2005), tensions (Berry, 2008) and pedagogical discontentment (Southerland, Sowell, Blanchard, & Granger, 2010) capture the essence of teaching as being problematic. A common theme across these theoretical frames is the value placed on uncertainty as a way of recognising a misalignment between intentions and actions.

In my experience of becoming a teacher educator, I initially drew on pedagogical discontent as a framework for recognizing moments of unease. However, not all moments of interruption engender feelings of negativity – which discontent tends to suggest. Unrest also encompasses a desire for action associated with positive emotions; a crucial perspective on learning to teach captured through the construct of Pedagogical Equilibrium (PE).

PE (Mansfield, 2016) draws on the theoretical lenses of cognitive equilibrium (Piaget, 1959), cognitive dissonance (Festinger, 1957) and pedagogical discontent (Southerland et al., 2010) and...
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offers an opportunity to frame and articulate the complexities of teaching – and in this study, how that plays out in teaching about teaching. PE is noticeable when a dilemma arises and unsettles routine knowledge - challenging existing equilibrium. In responding, learning abounds and as this study illustrates, sheds light on the complexity of teaching and offers opportunities to explore teaching and learning about teaching beyond the technical-rational (Schön, 1983).

Humans seek to make sense of new experiences through assimilation or accommodation (i.e., cognitive equilibrium) (Piaget, 1959). However, the human tendency is to rush through or avoid such situations as feelings of uncertainty and ‘not knowing’ tend to be uncomfortable (Dewey, 1930). The process of cognitive equilibrium is initiated through disequilibrium as a consequence of a lack of a schema to make sense of something new, hence the process of equilibration is initiated; in teaching, that same process is recognizable through PE.

In my shift from teacher to teacher educator I quickly became aware of how the problematic nature of teaching was raised to another level in teaching teaching. The journey from high school science teacher to science teacher educator has not been straightforward and PE has been a frame for understanding the development of my practice by using moments of uncertainty, perplexity and surprise as opportunities for learning. In essence, I have come to see how my learning about teaching has been an organised search for better states of equilibrium. The lens of PE therefore offered a way of framing the self-study reported in this paper because it created an invitation for learning about my teacher education practices.

Aim

This research reports on the development and application of the construct, Pedagogical Equilibrium (PE), as a way of framing and articulating my professional knowledge of practice as a teacher educator. The question that underpins this research is, ‘How has the use of PE as a way of confronting and processing my experiences of being a living contradiction supported my development as a beginning science teacher educator?’

Method

This paper presents a self-study project conducted during my second year as a teacher educator. The research was situated across two biology method units, with two classes in each unit consisting of approximately 58 students in total.

The research involved the collection of multiple data sets including:

- Personal Journaling before and after teaching at the start and conclusion of teaching semesters (PJ)
- Video and Audio Recordings of tutorial sessions (VR/AR)
- Student Reflections (post-tutorial) conducted by the RA in my absence (SR)
- Post tutorial Reflective Discussion between myself and critical friend/research assistant designed to probe taken for granted assumptions based largely on students’ responses during the post-tutorial reflections (RD).

All data were transcribed and a thematically analysed. Data sets were coded using the identifiers of semester 1 (e.g., S1 or S2), week number (i.e., week into the semester, W1, W2) and data source (e.g., PJ – personal journaling; SR – student reflections).

Results

As a beginning teacher educator one of the main challenges to equilibrium was what Whitehead (1989) described as being a ‘living contradiction’. I quickly came to see that modelling ‘good teaching practice’ was harder to enact than I had initially assumed. It played out in three distinct ways. The first was through developing a clear Recognition of moments where I noticed a
misalignment between my intentions and actions for teaching – either identified by myself (during self-reflection) or induced by discussion with my RA during our conversations/workshops. This led to problem setting and subsequent Actions that were initiated in an attempt to address the situation followed by Testing of the action in terms of perceived impact on student learning and engagement.

Recognition: Confronting ‘telling’ as teaching

One of my personal philosophical underpinnings of teaching was to model good educational practice. My journal data (PJ) before the teaching semester commenced highlighted my desire to model what I considered to be ‘good practice’, which included knowing where the students were at and using that as a way of planning teaching and learning experiences.

Modelling good practice is important to me – that I am showing my pedagogical reasoning so that I am demonstrating the complexity of the decision making process. They might then see the ‘back end’ of teaching as well as the ‘front end’. I want them to appreciate teaching as more than just giving an activity – that it is fluid and depends on the audience … It [shows] teaching is problematic, as you don’t necessarily know what to expect … (S1, W1, PJ)

Often, my rationale for workshop design highlighted the tensions experienced when feeling conscious of not wanting to act in certain ways, but that also meant feeling uncertain about how to work differently. My uncertainty was related to how to enact theory and create conditions for engagement in learning.

… I end up telling as a way of helping, but it’s not productive. I feel that my critical friend might be telling me what is possible or what I might do, but that again is telling and not teaching. This is more about my learning. How can I work this out for myself? What stimuli do I need to receive or how does it need to be structured to help me move along and to learn? Ideas are fine, but what I do and the way I do it is not the same as other people. I have to learn for myself and not necessarily be told. How to create those conditions for them [PST’s] where they can also learn without being told? (S1, W3, PJ)

So I still don’t know how to manage this. Do I go, “here are alternative conceptions, this is what they are, here’s a summary” or do I go, “Here’s an article, read it and you give me a summary and tell me what alternative conceptions are.” What if they don’t read it, or understand it? I want to do it that way because I know that way’s more meaningful but I only have 2 hours, so I’m torn between, ‘I’m going to have to tell you what this ‘alternative conception’ theory is and then we’ll go from there’, but then I’m torn because I’m telling. (S1, W1, RD)

I don’t like the way I feel after these tutorials. So much increased emphasis on what works and not works places pressure on me to think about and criticise my actions to the nth degree. It’s annoying and frustrating. I can live with some degree of uncertainty, but this feels … like I am second guessing all of my actions to the point where I don’t know what is the right course of action now. Am I a walking contradiction? Am I practicing what I preach? Am I not just doing to them what I say not to do – teach without knowing what the student needs? (S1, W10, RD)

With my pedagogical equilibrium unsettled, I found it difficult to justify my approach to teaching teaching. I was beginning to see that I felt as though I was preparing them for teaching when they were comfortable with teaching (i.e., more experienced) and not caught up in the early experiences of trying to manage their new role. I noticed a shift in my thinking. I was challenged by where they were in terms of their own needs and concerns and my sense of where I wanted them to be – and therefore ready to respond to – and the two were not necessarily congruent.
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John: You don’t have to blurt it all out and transfer it to them and I think if you can just … step back from it a little bit and have a little bit more confidence in your knowledge and go with your gut instincts ... I think sometimes you force it, like 'I've got to get them to do this and it's all on me', on yourself. Hand it over to them and give ownership to them ... in your head and in the activities, you've got the dissonance, but they don't. They just want you just to transfer your knowledge and your identity to them. 'Just tell us what we need to know'. In both workshops yesterday you mentioned at different stages about the relationship between theory and practice for them, but you also talked about their students and how important the context of teaching is for them. You said how they have to make it real for the year 9's and make it something that they can relate to as well. But then to be able to do that – they just can't transfer it into their own head and apply it to themselves ... so interesting and so frustrating that they do not see that as important. Hello, that's what she's talking about! It's applying [that lens] to me. It [what you are saying to them] applies to me. That's why you're creating these situations for them but they don't seem to understand it themselves. It's just crossing that bridge ...

Jennifer: I don’t necessarily think this teacher education model works well like this because we’re telling them stuff that they’re not ready for, so we’re automatically teaching in a way that contradicts what we’re teaching. We talk about, ‘you've got to know where your students are at’. Well, I can’t just teach about classroom management because that only prepares them for the first two years. (S2, W10, RD)

Deliberately seeking to understand the cause of uncertainty enables framing and setting of a problem, thus making it explicit. However, in becoming sensitised to the problem, more of the associated complexities of the problem become apparent. Similarly, realisation about the nature of the problem can be stressful as more complexities of the problem emerge, leading to further uncertainty. This can lead to feelings of helplessness, which can lead to avoidance. Therefore, framing the problem with the help of a critical friend, and moving on to trialling particular modes of action are valuable in maintaining perspective and assisting in persevering and making progress.

Action: Problem setting as a way of moving forward

In framing and therefore thinking more deeply about the root cause of my challenge to equilibrium (i.e. feeling like a living contradiction) I was able to ‘set’ the problem. In setting the problem I was then able to start to conceptualise action plans where I could start to find ways of addressing the sense of unrest. Framing action plans on a weekly basis was more manageable physically and mentally, as the action could then be placed in the context of individual workshop experiences. This also provided opportunities to test out individual actions which invited reflection and unpacking with my critical friend afterwards.

This week it is going to be more about them and less of me. If they have not engaged it will have to hurt, as that was what was required. They cannot work well in this first section without having done the pre-reading materials. How will I cope when they stress and put up blockers about not being able to engage because they have not done the pre-thinking? (S2, W2, PJ)

Still lots of telling – I feel like I am rushing, but it seems like there is not enough time. I know that not everything I am telling them is important, nor is it landing for everyone. Experience is more meaningful than telling – but which experiences are best? (S2, W2, RD)

Planning to do things differently meant that post-teaching discussions with my critical friend called some of my actions into question and caused me to see that although I was trying to act in ways that I felt might address my pedagogical concerns, it did not mean that resolution was
immediately at hand. Sometimes actions exacerbated the existing sense of uncertainty.

Jennifer: It’s not about them learning the content, it’s them learning how to set up conditions to help their students learn about the content - still unsure how to do that. Because I’ve been very positivist in the past and my PhD caused me to, sort of, swing so far the other way, I wonder with my teaching whether I have swung too far the other way. It’s almost like it’s becoming too theoretical … should I be making some things more explicit rather than trying to get them to critically think and come up with the ideas themselves? Should I be saying, ‘right, here is a way in which you can assess student progress that is formative in nature’, and actually just tell them? Rather than getting them to see the value in it themselves and developing that thinking themselves? Am I making this too hard for myself?

John: No, I don’t think your bar is too high, but do you need more scaffolding? … Maybe you [could] provide the resources for them to get to the new level and the opportunity to reflect on something at that level and then introduce them to the next level, but you don’t have to actually give it to them. You don’t have to hold their hand. (S2, W10, RD)

With many possibilities for acting, it can be difficult to know which action will have the most desirable result. Therefore, action is experimental, where possible modes of action can only be trialled and then assessed. To learn from these experiences, reflection needs to be more than just focusing on the specifics of any given situation. It needs to also involve stepping back to draw inferences about the experience that can inform future practice more productively. As teaching is problematic, thinking about the nature of a situation and modes of actions means not seeking ‘one size fits all’ solutions. This kind of reflection on action is challenging and requires focused reflection which benefits greatly from collegial perspectives and associated non-judgement discussion.

Testing: Learning about students’ engagement in learning about practice

Recognizing a problem and developing ways of acting led to a questioning of the influence that my learning about practice had on my students’ learning about practice. Learning about different ways of structuring learning opportunities and the conditions I thought might be effective (in theory) and then coming to know (through experience) the impact was also challenging. Managing this challenge helped in some ways to address my need for pedagogical equilibrium because it led to deeper personal learning. In so doing, the learning I was experiencing about my teaching of teaching was more substantive than I might earlier have envisaged.

Jennifer: I was actually pretty happy with yesterday. Yeah I thought – I’m beginning to get a better appreciation for the less is more [principle]. I still struggle with it – so much I feel I have to get in at the start of a unit. But, yesterday I got a feel for that, the less is more idea. I walked away thinking yeah, I’ve got a better appreciation for that now because I think part of my tendency, and as a teacher has always been, I’ve got to make sure I’ve got enough to do and that it’s got to cover everything I need to cover, but it doesn’t necessarily have to be cramming everything in. So learning what can be put back on them to do and what is valuable for them to do with less help from me, but the implication for that is, the preparation for it has got to be good. So the thinking you put in beforehand and what you get them to do beforehand then becomes important but then that has time management issues because you think you have these great ideas but do you have enough time to get them to do it all. So for next year, I will get them to do more beforehand, but I now know what that will look like. (W2, S2, RD)

Jennifer: Because I wonder too whether they can draw out if I were to give them more group time and I think this is also that letting go and being confident in that they will engage –
letting go of that control then how do we bring it back together and unpack it as a group, or do we need to have so much back together and unpacking as a group? … But then I don’t know how to unpack as a group because if I unpack with one table like we did with that graph and the trends on the graph only that table benefitted from that. That is not shared with everybody else. So the idea of bringing it back as a group is to share the understandings with everybody … (S2, W12, RD)

Testing of my action plans was valuable, especially as the learning was derived of not only my ‘lived experience’ but also that of my students. As I came to see how my testing led to different forms of student engagement it encouraged me to plan more confidently for the future – not necessarily because I had something ‘new’ to do, but rather because I had experienced new forms of shared learning experiences; the conditions for learning (Smith, 2017) I was attempting to create appeared to be having traction.

Learning about student engagement led me to the realisation that learning has to be a considered conversation between all members. When one person feels listened to and feels that their contribution directs the flow of the discussion, they are more likely to engage in learning through participation and therefore become more invested in the process. The challenge as a teacher educator is to allow that knowledge to shape my practice and the ongoing challenge is to continue testing ways of enabling this ‘conversation’ with my students of teaching.

**Conclusion**

As this study suggests, I have come to see that being comfortable with uncertainty offers a positive way of naming and framing my practice; being comfortable with uncertainty is somehow empowering. Moments that stimulate perplexity, curiosity, or surprise begin to demand attention in ways that go well beyond searching for the ‘best way’ of acting. As such, managing dilemmas offers a conduit to knowledge development through the experience of searching for a more steady pedagogical state, i.e., the search for pedagogical equilibrium results in learning.

As the data in this paper shows, PE created an interactive and recursive process of data collection and analysis of not just my practice, but also my understanding of my students’ experiences of that practice. As the data suggests, uncertainty triggers a search for a new state of equilibrium; something that is important in understanding both teaching and learning about teaching as a complex and sophisticated business.

Considering my learning about teaching teaching as a search for PE offered a lens for conceptualizing, describing and interrogating practices and beliefs of teaching teaching and confronting being a ‘living contradiction’. Interruptions offered the opportunity for learning about my teacher education practices by inviting ‘discussion’ with the situation through reframing (Schön, 1983). Therefore, becoming unsettled and experiencing uncertainty, surprised or not knowing how to act were valuable indicators (and perhaps necessary ingredients) of learning about teaching.

As I trust this study illustrates, teaching about teaching can be viewed as an invitation to develop ways of making the problematic explicit for students of teaching within the context of their shared learning about teaching experiences. If they learn to be comfortable with uncertainty in their own learning about practice it might help them to see beyond learning to teach as a search for ‘activities that work’ (Appleton, 2002) and genuinely begin to understand teaching as a complex and sophisticated business; that would be a very good outcome for teacher education.
References


