Australian Journal of Teacher Education

Volume 37 | Issue 8 Article 1

2012

Dead Certainty? The Case for Doubt in Teacher Education.

Sandy Schuck
University of Technology, Sydney, sandy.schuck@uts.edu.au

John Buchanan
University of Technology, Sydney, john.buchanan@uts.edu.au

Dead Certainty? The Case for Doubt in Teacher Education

Sandy Schuck
John Buchanan
University of Technology, Sydney

Abstract: In this conceptual paper we discuss the value of doubt in teacher education for ourselves and, by implication, more broadly. We develop an argument for the value of doubt in teacher education that grows out of the recognition of the complexity of teaching. We interrogate meanings of doubt in this context and debate the value of doubt and certainty. We also indicate the challenges of fostering and nurturing doubt in teaching and teacher education. We suggest that doubt is a necessary element of teacher education as its presence helps to prepare our students for their careers as teachers in a complex and uncertain world. It is also more fundamentally honest than a professed certainty on the part of the teacher educator.

Introduction

This conceptual paper discusses the importance and contributions of experiencing doubt in teacher education. The paper seeks to dispel common myths, as well as teacher educators' assumptions (Foster, 2011; Russell & Grootenboer, 2008) about teaching and teacher education by arguing for the value of doubt as a success indicator of teacher education programs.

The authors of this paper are two Australian teacher educators who engage regularly in discussions about our teaching. Our discussions have led to an explicit awareness of the presence of doubt and its effects in our professional lives. As a consequence of our heightened awareness of the role of doubt in our practice, we seek to broaden this discussion beyond our own practice and raise implications for teacher education, by investigating the impact of doubt in teacher education for both teacher educators and their students. We interrogate what is meant by doubt in teaching and teacher education, investigate what this attribute can bring to learning and teaching, and debate whether and how the presence of doubt might benefit teacher educators and teacher education students or, alternatively, might be an obstacle to quality in teacher education.

Throughout the world, teacher education programs are often criticised by their graduates as being ineffective in preparing them for the complexity of teaching in classroom contexts. Difficulties appear to arise in integrating theory and practice, in developing the ability to apply a self analysis lens to teaching practice, and in constructing an integrated body of knowledge about teaching (Eilam & Poyas, 2009). This critique of teacher education programs focuses on their deficiencies in preparing student teachers for complexity and self-analysis. Yet, at the same time, a key success indicator often used in university course evaluation questionnaires throughout the western world is related to the amount of confidence graduates feel on embarking on their new profession.

We argue that these divergent requirements of teacher education programs might be in unhealthy conflict. In this paper we will suggest that confidence or self-efficacy might not be the most appropriate success indicators of a teacher education program (see also Settlage, Southerland, Smith & Ceglie, 2009) and will make the provocative argument for the presence of

doubt as a success indicator instead. We will indicate the value of awareness of complexity and ability to engage in self-analysis, as these are likely to lead to feelings of doubt and a healthy scepticism on graduation, due to realistic expectations of the task ahead.

This paper is located in a global context in which the development and implementation of standards has become an increasingly important aspect of teacher education and teaching. Koster and Dengerink (2008) indicate the prevalence and variety of standards developed in the US, UK, Australia and the Netherlands. These standards indicate what teachers and/or teacher educators are supposed to know and do (Ingvarson, 1998), and often appear as unproblematic in their presentation and perspective on quality.

There is much debate about such standards in teaching and teacher education globally, with some authors arguing that the standards encourage instrumental measures of competency (Koster & Dengerink, 2008), others suggesting that the standards mask the complexity and uncertainty of teaching (Korthagen, 2004; Zeichner, 2005), and yet others suggesting the de-professionalism of teaching might be an outcome of such standards, as they feel that the need to reflect and consider teachers' values is diminished through the presence of these standards (Cochran-Smith, 2001). It can be argued that this standardisation of teaching often leads to a checklist of competencies that are required by teacher educators or teachers, and that these standards can militate against the importance of variation and complexity in teaching.

As a result of the increasing demand for teacher graduates to meet externally imposed standards and competencies, teacher education programs often strive for certainty and privilege those standards that are easily measured. Koster and Dengerink discuss their efforts to ensure that the Dutch standards for teaching are considered, not as a checklist of competencies, but rather as showing complexity. An example given is '… models excellent teaching…' (2008, 140). However, we believe that the broadness and ambiguity necessary to include complexity in a standard makes the act of realising that standard complex in itself.

We suggest that the importance attached to teacher standards seems to imply that there is one 'right way' to teach. This view of teaching does not allow room for doubt. We argue that this view severely limits our student teachers' abilities to respond to the complexity and uncertainty of the classroom.

The Problems With Embracing Doubt

In this age of accountability with its corresponding emphasis on 'best practice', doubt appears to be undesirable. This is not new; western cultures have long abhorred doubt in the promotion of dogma by institutionalised religion, to give but one example (McEvilly, 1999). However, doubt has had its proponents throughout history.

While we do not propose a treatise on the history of doubt here, we mention in passing some episodes. A western epistemological school or tradition of doubt can be traced back at least as far as Pyrrhon, whose philosophy would not admit intellectual assent to any untestable premise. Consistent with this, doubt itself was accorded only provisional assent, its status treated with caution (Bett, 2010). Eastern traditions of doubt and scepticism, such as those in Zen Buddhism (Heine & Wright, (2000), have a longer history again. Michel de Montaigne is sometimes credited with reviving a school of doubt in the modern era (Hartle, 2003), although Al-Ghazali's Sufi mysticism (Giffel, 2009) arguably contains many similar ideas, from about four centuries earlier. René Descartes' *I think, therefore I am*, has become a popular catch-cry of solipsistic doubt. Doubt has been seen as a way of removing superstition to clear the path for 'truth' in writings about Christian thought by John Locke and Francis Bacon (McEvilly, 1999).

Enlightenment philosopher David Hume (1902, 40) claimed that, 'belief is nothing but a more vivid, lively, forcible, firm, steady conception of an object, than what the imagination alone is ever able to attain'. Traditions of doubt or scepticism continue through worldviews such as atheism and empiricism. We do not necessarily share many of these thinkers' doubts or these doubters' thoughts, however. Our doubt is more doubtful. While they may have asserted doubt as a philosophical starting point, we merely ask for a doubtspace in which to play; to explore our teaching and our thinking about our teaching. And this, mainly so as to leave space for things that we are yet to learn and unlearn, as we work to actualise our terrifying freedom. While our pedagogy busies itself with being critical, in line with a Freirean tradition we so admire, we also wish to remain critical of our pedagogy.

Our need for a doubtspace in which to learn is not at odds with educational traditions. Doubt has had an important part to play in learning. Dewey argues that true learning is based on the solving of perplexing problems and reflection on this experience (Harkavy & Benson, 1998). Schön (1995, 31) notes the role of doubt in Dewey's views of inquiry: 'thought intertwined with action – which proceeds from doubt to resolution of doubt, to the generation of new doubt.' For Dewey, Schön notes, doubt exists in the situation, and inquiry 'begins with situations that are problematic – that are confusing, uncertain, or conflicted, and block the free flow of action' (1995, 31). Thus without doubt, there is no inquiry. Freire and Macedo (1987, 36) add to the case for doubt by suggesting that when we become 'less certain of "certainties"', we sharpen our capacity for critical pedagogy. Therefore, it is clear that there is a proud tradition of advocates for doubt.

Doubt, however, is not easy to accommodate in education. Teacher educators and teachers often resist doubt. Understanding why this may be so helps to illuminate the complexity of the concept. We start this process by considering why doubt's existence presents us with such challenges.

Much if not all new learning involves the risk or reality of opening existing knowledge to questioning, exposing, scrutinising, weighing, measuring and otherwise prodding. New learning often suggests to us that we might have got it wrong thus far. The known, enjoying its privileged position, is resistant to risking being dethroned or usurped by a pretender. Doubt could be seen as the 'unknown intruder', or the child who not only declares the emperor naked, but then dares to stare.

Further conspiring against the acceptance of doubt, is the notion of 'ideological amplification' (Sunstein, 2007, 273) whereby people with similar views tend to associate, mutually echoing and thereby amplifying and normalising, rather than scrutinising and interrogating, their assumptions about social and cultural propriety. It is reasonable to assume that this also occurs internally; the established, credible voices in our head are resentful toward and intolerant of contradiction, particularly from newcomers. Put another way, 'knowledge' seeks to be inert, in both senses of the word: resistant to movement and resistant to the potential volatility of reactions with contradictions and the like.

A result of these processes is the desire to see doubt as a deficit, to be eliminated. Of the literature available, much seems to describe doubt's debilitating characteristics. A good part of this discussion appears to be couched in the context of coping with structural change, which perhaps explains why doubt and uncertainty are seen as negatives. And so we agree with Helsing (2007) that an important question is whether doubt is an asset or a liability.

Adding to the perception of doubt as a liability we note that one of our pressing needs appears to be the neutralisation of ambiguity. Among the intercultural continua of Hofstede (1984) is uncertainty avoidance. He addresses not just levels of uncertainty avoidance (which he

appears to accept as a given) but also different cultural norms for dealing with this, such as embracing faith, superstition, the taking of precautions and the like.

Interestingly, however, Schechter (2004) argues that there is a relationship between the level of error criticality (that is, immediacy of consequences) and professional doubt. He adds that those in professions with high stakes and immediate risk, such as doctors, doubt and reform their practice more readily than do teachers. It is perhaps worth pondering where humankind might be now, if no one had ever dared or felt compelled to doubt the medical practice of the day, or, for that matter, approaches to first aid. This thought leads neatly into our affirmation of the value of doubt for teacher education.

The Value of Doubt in Teacher Education

Why are we suggesting that doubt is a commodity to be valued in teaching and teacher education? We believe that teacher education programs are duty-bound to provide opportunities for students to experience a variety of viewpoints, and to understand that there is no single 'string theory' of learning or single form of knowledge (O'Neill, Bourke & Kearney, 2009). As well, we support the view that teaching is a complex activity and that student teachers ought to be made aware of this complexity. Complexity is one of Gladwell's (2008, 149) three essentials of work satisfaction, the others being autonomy and a connection between effort and reward. We note that Gladwell's other two essentials are also related to doubt, certainty, trust and confidence. Through acknowledging uncertainty in teaching strategies and activities, student teachers ideally become more open to a range of possibilities and opportunities, and the construction of environments in which different learning may take place (Gray & Colucci-Gray, 2010).

Arguments supporting our case for doubt are provided by Goodwin (2010) and Akiba, LeTendre and Scribner (2007), who note that there is still little agreement globally about what constitutes excellence in teaching or how best to attain this excellence. At the same time, governments across the world are actively seeking ways to measure the competency of teachers and are developing measures which emphasise 'perfomativity' (Lyotard, 1984; Sahlberg, 2011). By definition, these measures privilege that which can be measured and ignore more intangible aspects of teaching. As a result, notions of quality teaching (and indeed the whole teacher education discourse) often become bogged down in views of teaching as a technical craft with a set of characteristics that are easily identified, transferred and measured. Teaching as a critical, reflective and reflexive art is neglected (Hardy, 2009). Again the place for doubt seems to be central to the debate. We concur with Schechter (2004) who points out:

> *the diverse needs of students require diverse goals and approaches in order to do justice to the professional objective. As a result, educational goals and approaches are more difficult to understand, more elusive and have a broader impact on their target.*(175).

Doubt informs and nurtures our teaching and our learning; it is therefore arguably more valuable than surety, and provides more sustenance, even though surface appearances might suggest otherwise. Wheatley (2002, 9) argues for a 'substantial disequilibrium' and a 'perturbation' in our pedagogical assumptions if we are to re-form our practices. He goes on to claim that, 'educational policy often ignores or subverts beneficial doubts' (2002, 19). And yet the volatility of doubt is also likely to generate confusion, resentment and defensiveness. Thagard (2011) refers to doubt's propensity to irritate as being analogous to the process that leads to the formation of a pearl. As Schechter (2004, 172) observes, 'doubt is the spark necessary for initiating [or our preferred term, "igniting"] a learning process'.

We do not claim that we are pioneers in exploring doubt. Its virtues seem to have been whispered to us down the ages, by Pyrrhon (Haezrachi, 1996) and Dewey (1930) among others. Still, these whispers do not appear to have gained much purchase in educational thinking. Perhaps, though, this marginalised position is an optimal habitat for doubt.

Teaching Students and Teacher Educators to Doubt

Beginning teachers usually have very high expectations of themselves when they start to teach. For some, it is difficult to accept less than perfect solutions and they are unwilling to compromise but rather constantly seek the perfect solution. This can result in them leaving the profession when they are unable to find or implement an ideal, tidy solution to ill-defined problems. However, for others, research shows that one of the reasons they stay in the profession is their ability to live with less than perfect solutions, ones that satisfy but are not necessarily the best.

Taking this into account, Le Maistre and Paré (2010) report on the need for teacher preparation programs to help neophytes in this process by 'being less categorical about providing clear-cut "ideal" solutions to problems' and suggest problem-based learning (found in business and engineering programs) as a 'strategy for providing student teachers with realistic, ill-defined problems [rather] than contrived situations that are more common in pedagogy textbooks' (2010, 563-564).

In a similar vein, Brady and Schuck (2005) argue that if mentors are to support beginning teachers effectively, they need to be mindful that teaching is complex and dynamic. Beginning teachers should be encouraged to accept and embrace that complexity and uncertainty. Further advice on the preparation of student teachers comes from Loughran (2005, 31) who urges teacher educators to model 'the doubt, perplexity, uncertainty and risk-taking that encompasses the problematic nature of practice'.

Doubt demands (and deserves) an audience, both interpersonal and intrapersonal; an intercourse or discourse of doubt. Schechter (2004, 177) argues in one sense paradoxically that the creation of 'safe spaces can lead teachers to unfamiliar territory, disturbing their ongoing and comfortable path'. Schechter points out the need to 'reduce the impact of defensive routines that dramatically guide people's behavior' (2004, 177). As teacher educators we need to create environments in which students are confident enough to step beyond those defensive barriers.

While recognising that the task in teacher education programs includes supporting students to enhance their subject matter knowledge and to develop pedagogical skills and approaches, we agree with Goodwin (2010, 22) that 'we need to conceptualise teaching knowledge in ways that transcend practicalities (and limitations) of discrete teaching skills and tools' and support our students in developing habits of mind (Wheatley, 2002) that will allow them to make decisions in an increasingly complex world about issues that we are unable to anticipate at present. As well, we argue that it is imperative for student teachers to understand that teacher education courses cannot possibly prepare them for every classroom contingency that might occur. Instead, if teacher educators prepare them to expect and manage the doubt that will inevitably occur for reflective practitioners, we believe they will be better and more resilient practitioners, and will cope better with the vicissitudes of the job.

Current educational directions of a number of countries, including Australia, the United States and the United Kingdom, emphasise the importance of evidence-based research. Atkinson (2000) argues that such a preoccupation with tangible evidence on the part of funders and policy developers can lead to a limited view of learning and teaching. In such a view ideas such as the

value of doubt are not entertained and do not fit with the epistemological stance that evidence provides certainty.

And yet, policies developed as a result of this evidence-based research do not appear to have resulted in widespread improvement in learning. Some educational outcomes might have improved due to a better alignment of testing and content, but it is questionable whether the quality and proportion of higher-order learning has increased. Sanger (1995, cited in Atkinson 2000, 327) urges us to interpret our research in ways that 'acknowledge the unknown and the unpredictable'. This discussion leads us to question the nature of evidence that appears to count in matters of educational quality, and why it should do so.

Teachers and teacher educators alike are tempted to seek resolution and tidiness. Doubt offends and affronts both of these. Citing Brookfield (1995, 1), Helsing (2007, 1322) notes, 'teachers who cannot entertain uncertainty about their beliefs and practices can get caught in a "vicious cycle" (sic) of innocence and blame'. The drive to align, reconcile and thereby soothe our idealised and actual professional selves is a powerful one for most of us, perhaps particularly so for many of us drawn to service professions such as teaching and teacher education. This can be exacerbated by the contexts of high-stakes testing.

The Current Context and the Place of Doubt

We accept that with this call to doubt, we are swimming against a tide, if not a torrent, of doubt-abhorring accountability, performance and so-called 'quality indicators'. In Australia, Murray, Nuttall and Mitchell (2008) suggest that recent developments in teacher education, such as the development of competency lists, can be criticised for leading to more superficial learning. More broadly, in the tertiary context, course evaluation questionnaires and similar measures are being used increasingly to compare institutions.

All of these measures militate against the promotion of doubt. Similar measures are occurring internationally: for example, a Canadian study (Grimmet, 2007) indicates a shift to more practical and technical instruction. As a further example of the privileging of 'hard' evidence, Britzman (2003) notes the privileging, by students and governments, of the practicum experience as compared to other knowledge gained in teacher education programs. In all these contexts, doubt does not easily find a home. We contend that a reduction of doubt potentially correlates to a reduction of complexity, robbing concepts of their nuances. Here again, there is a dilemma for the teacher. Is not one of the essences of teaching the ability to take the complex and render it simple for the neophyte to understand?

Paradoxically, for teacher educators to concede or confess doubt in teaching can also be debilitating. It can freeze us into inaction (Wheatley, 2002). So we need to look at how our teaching can be both doubt-filled and yet invigorated and infused with energy. Are these two sets of constructs in opposition to one another or complementary? Can we experience and embrace both simultaneously? It may be that one's capacity to doubt one's professional self is premised on one's ability to believe in one's professional self, at least to some extent. Counter-intuitively, perhaps doubt is the profligate luxury of the believer, the preserve of the self-confident believer at that. As such, it is less likely to be espoused by newcomers to the profession.

Perhaps it is a matter not so much of minimising or avoiding uncertainty, but of stepping outside it, looking at it, maybe mapping and dissecting it from this new and more dispassionate and disinterested, and less threatening standpoint. Helsing (2007) offers a more complex ecology of questions about uncertainty, as an alternative to the 'uncertainty as asset/uncertainty as

liability' dilemma. This includes the contextual aspects of uncertainty and doubt, such as how, when, to what extent and why might doubt be an asset or a liability.

The Impediments to Doubt

Contextual factors including fee-paying students, politicians pandering to constituents and university management capitulating to calls for accountability, all undermine a tolerance of doubt. Doubt is misconstrued as lack of expertise while surety is presumed to be a measure of professionalism. Let us assume for a moment that doubt is the complement or deficit of knowledge. If so, it is reasonable for students to look to their teacher educators, for a dispulsion of doubt. In our experience in an Australian setting, students certainly appear to reinforce and reward our (apparent or feigned) certainty. In the context of teacher education in the United States, Goodwin (2010) agrees, noting that teaching 'recipes' for effective classroom practice are sought and rewarded by student teachers. And yet we believe that teacher educators are displaying a certain dishonesty if they offer their students definitive, cover-all answers to questions of pedagogical process.

Consequently, some learners seem to find it unseemly for their teachers to have, let alone to confess, doubts. Some remind their teachers that they want them (and pay them) to know and to tell. This arguably exacerbates and is exacerbated by a client mentality among students. Part of the motivation for this on the part of students may be that it displaces at least some of the onus for learning from the learner onto the teacher. So, in a double downward helix movement, expunging doubt can contribute not only to our own regression to passivity, but also to our students' complacency and comfort. Again, the client stance of learners comes into play. It is reasonable for customers to harbour an expectation that travel and accommodation episodes will be comfortable. But not so education?

Similarly, the universities as teacher educators' employers are uncomfortable with expressions of doubt by their teaching staff. The global commodification of education and the need to sell our expertise in a competitive marketplace do not sit well with expressions of doubt. Both these external circumstances make the expression of doubt a courageous one and encourage teacher educators to sublimate or repress any such sentiments, as we regress toward what Wheatley (2002, p. 12) calls a 'narrow quantifiable curriculum'. This commodification will likely render us more fearful of and averse to experimentation and the confession of doubt. It will also probably further force teachers into the mould of students' visions of the ideal in teachers, teaching and learning, ideals that are genuine yet arguably misguided or at least under-scrutinised and under-problematised.

A third enemy of doubt is most likely to be found on the benches of parliaments; our politicians are expected to show certainty about all matters. Doubt is seen by a naive constituency as an indication of inadequacy. It would be political suicide for politicians to confess that teaching and education are complex and that they do not hold the solutions to all educational problems. Rather, a preoccupation with measuring the unmeasurable is promoted as a way of demonstrating understanding of a complex issue. It seems to us that education would benefit most from having policy makers who experience doubt and who understand the complexity and lack of certainty inherent in teaching.

Conclusions

We conclude by suggesting some possible ways forward for teacher education arising from this discussion but include the following caveat: a definitive call to doubt might be at odds with our beliefs and understandings of its value; for the sake of consistency, we feel compelled to doubt the value of doubt as well. And yet we dare to trust that the efficacy of doubt transcends our idiosyncratic understandings, perspectives and experiences of it.

Our analysis of the value of doubt indicates several directions that teacher education might take to both insert doubt into our programs and to teach our students how to manage that doubt. Teacher educators need to tread the fine line between freezing student teachers into inactivity through an emphasis on the complexity and uncertainty of teaching, and encouraging student teachers to engage with doubt and use it to enhance their practice.

Accordingly, one area that needs to be further developed in teacher education programs is that of *resilience*. The resilient student will be better able to cope with doubt and uncertainty. Perhaps the most helpful direction is for teacher educators to affirm in our students a resilience in the face of doubt, rather than a quest for certainty with potentially, its dual end-points of complacency or despair.

One of teaching's beauties, as well as one of its terrors, is that it can never be done to perfection. If we can share this message with our students, it should provide them with stamina and resilience when they find their own practice imperfect. Taking Loughran's suggestion (2005), modelling our doubt in our own practice as teacher educators might help to disseminate this message. Resilience here may help our students to persist in the face of apparent or real unfulfilled or unrequited hopes.

Using critical friendships to remind us of the variety of ways in which teaching occurs and the reasons for the different manifestations of teaching is also helpful. Critical friendships provide a safe place to jolt us out of complacency and force us to think beyond our practice. Our students too, should use critical friendships when they are teachers. This might well be as useful to them as anything we can provide in our teacher education programs. And we should remember that the range of ways in which our students perceive and make sense of their world far exceeds the spectrum visible to us.

It is clear that changing teacher education programs so that doubt becomes a success indicator is unlikely to get traction in a world of accountability, competition and standardisation. However, we put forward suggestions based on some of Loughran's assertions about a pedagogy of teacher education (2005, 34-39), which move towards this goal. Some of these include:

- encouraging our students to develop the confidence to be uncertain. Loughran suggests that powerful learning can come from unplanned teachable moments and we argue that being open to those unplanned moments requires an ability to tolerate uncertainty.
- discomforting our students by helping them see the limitations in their teaching. Uncomfortable experiences often lead to powerful learning.
- acknowledging the value of cognitive and affective dissonance in reshaping practice. As teacher educators, we should model this dissonance in our own teaching and lay that bare to our students.
- accepting that teacher education is going to be unfinished business, and that substantial and significant learning will occur in the classrooms of our future teachers.

One way we have of viewing the role of doubt in our professional practice is as a series of temporary unsettlements. The notion of settling down is very seductive, and perhaps becomes more so with longevity in the profession.

It is this that we wish to defy, or at least to resist and challenge.

Finally, we conclude with a central question for teacher education. How is doubting generative of better teaching? We do need to ask what our doubt contributes to our teaching and to our students' teaching and learning. The authors have found value in accepting doubt as a valuable component of our teaching, and argue for acceptance of its value as a possible strategy for other teacher educators. Wheatley (2002, 13) speaks of the capacity to 'make peace with uncertainty', but this, too, may be part of the problem and the solution. We hope that this paper will stimulate some responses and open a conversation among teacher educators about the place of doubt in our teaching.

References

Akiba, M., LeTendre, G. & Scribner, J. (2007). Teacher quality, opportunity gap, and national achievement in 46 countries. *Educational Researcher, 36*, 369–387.

Atkinson, E. (2000). In defence of ideas, or why 'What works' is not enough. *British Journal of Sociology of Education, 21*, 317-330.

Bett, R. (2010). *The Cambridge companion to ancient scepticism.* Cambridge: Cambridge University Press.

Brady, L. & Schuck, S. (2005). Online mentoring for the induction of beginning teachers. *Journal of Educational Enquiry, 6*, 65-75.

Britzman, D. (2003). *Practice makes practice: A critical study of learning to teach* Revised ed. Albany, NY: State University of New York Press.

Cochran-Smith, M. (2001). Higher standards for prospective teachers: What's missing from the discourse? *Journal of Teacher Education, 52*(3), 179-181.

Dewey, J. (1930). *The quest for certainty: A study of the relation of knowledge and action.* London: George Allen & Unwin.

Eilam, B., & Poyas, Y. (2009). Learning to teach: Enhancing pre-service teachers' awareness of the complexity of teaching-learning processes. *Teachers and Teaching: Theory and Practice, 15*, 87-107.

Foster, J. (2011). Sustainability and the learning virtues. *Journal of Curriculum Studies.* Retrieved 10 June 2011, from http://www.informaworld.com/smpp/content~db=all~content=a933116455.

Freire, P. & Macedo, D. (1987). *Literacy: Reading the word and the world.* UK: Routledge.

Giffel, B. (2009). *Al-Ghazali philosophical theology*. New York: Oxford University Press.

Gladwell, M. (2008). *Outliers: The story of success*. New York: Little, Brown and Company.

Goodwin, A. (2010). Globalization and the preparation of quality teachers: Rethinking knowledge domains for teaching. *Teaching Education, 21*(1), 19–32.

Gray, D. S. & Colucci-Gray, L. (2010). Challenges to ITE research in conditions of complexity. *Journal of Education for Teaching: International Research and Pedagogy, 36*, 425-439.

Grimmett, P. (2007). The professional governance of teacher education in Ontario and British Columbia: Culmination of three decades of research and policy in Canadian teacher education or harbinger of a different direction? In T. O'Donoghue & C. Whitehead (eds.). *Teacher education in the English-speaking world: Past, present and future*. Charlotte, NC: Information Age.

Haezrache, P. (1966). *On doubting*. Jerusalem: Hebrew University Press.

Hardy, I. (2009). Teaching for self or others: Lessons from an educator's log. *Teaching Education, 20*(2), 163-174.

Harkavy, I. & Benson, L. (1998). De-Platonizing and democratizing education as the bases of service learning. *New Directions for Teaching and Learning, 73,* 11-20

Hartle, A. (2003). *Michel de Montaigne accidental philosopher*. New York: Cambridge University Press.

Heine, S. & Wright, D. (2000). The Koan texts and contexts in Zen Buddhism. New York: Oxford University Press.

Helsing, D. (2007). Regarding uncertainty in teachers and teaching. *Teaching and Teacher Education, 23,* 1317-1333.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Thousand Oaks, CA: Sage.

Hume, D. (1902). An enquiry concerning human understanding. (2nd Ed.). Retrieved 9 August 2012, from http://www.gutenberg.org/files/9662/9662-h/9662-h.htm

Ingvarson, L. (1998). Professional development as the pursuit of professional standards: The standards-based professional development system. *Teaching and Teacher Education, 14*(1), 127-140.

Korthagen, F. (2004). In search of the essence of a good teacher: towards a more holistic approach in teacher education. *Teaching and Teacher Education, 20*(1), 77-97.

Koster, B. & Dengerink, J.J. (2008). Professional standards for teacher educators: How to deal with complexity, ownership and function. *European Journal of Teacher Education, 31*(2), 135-149.

Le Maistre, C., & Paré, A. (2010). Whatever it takes: How beginning teachers learn to survive. *Teaching and Teacher Education, 26*, 559-564.

Loughran, J.J. (2005). Knowledge construction and learning to teach about teaching. In D. Beijaard, P. Meijer, G. Morine-Dershimer & H. Tillema (eds.). *Teacher professional development in changing conditions,* pp. 27-41. Dordrecht: Springer/Kluwer.

Lyotard, J.F. (1984). *The postmodern condition: A report on knowledge* (J. Bennington & B. Massumi, trans.). Minneapolis, MN: University of Minnesota Press.

McEvilly, T.C. (1999). *Sculpture in the age of doubt*. NY: Alworth Press.

Murray, S., Nuttall, J., & Mitchell, J. (2008). Research into initial teacher education in Australia: A survey of the literature 1995-2004. *Teaching and Teacher Education, 23,* 225-239.

O'Neill, J., Bourke, R., & Kearney, A. (2009). Discourses of inclusion in initial teacher education: Unravelling a New Zealand "number eight wire' knot. *Teaching and Teacher Education, 25*, 588-593.

Russell, H. & Grootenboer, P. (2008). Finding praxis? In S. Kemmis & T Smith (eds.). *Enabling praxis: Challenges for education*. Rotterdam: Sense Publishers.

Sahlberg, P. (2011). *Finnish lessons: What can the world learn from educational change in Finland?* New York: Teachers College Press.

Schechter, C. (2004). Teachers' perceived need to doubt: School conditions and the Principal's role. *The International Journal of Educational Management, 18,* 172-179.

Schön, D. A. (1995). Knowing in action: The new scholarship requires a new epistemology. *Change, Nov/Dec,* 27-34

Settlage, J., Southerland, S., Smith, L. & Ceglie, R. (2009) Constructing a doubt-free teaching self: Self efficacy, teacher identity, and science instruction within diverse settings. *Journal of Research in Science Teaching, 46*(1), 102-125.

Sunstein, C. (2007). Ideological amplification. *Constellations: An International Journal of Critical and Democratic Theory, 14*, 273-279.

Thagard, P. (2011). What is doubt and when is it reasonable? Retrieved 10 June 2011, from http://cogsci.uwaterloo.ca/Articles/doubt.html

Wheatley, K. (2002). The potential benefits of teacher efficacy doubts for educational reform. *Teaching and Teacher Education, 18*, 5-22.

Zeichner, K. (2005). Learning from experience with performance-based teacher education. In F. Peterman (ed.). *Designing performance assessment systems for urban teacher Preparation.* Mahwah, NJ: Lawrence Erlbaum, 3-20.