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"Knowing Well" in the classroom: Epistemic Challenges and Competencies

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Introduction

In his introduction to literary theory for tertiary students, Jonathan Culler (2011) writes that the endless nature of theory can be overwhelming. A field of research may appear exhilarating in its infinite possibilities, but the very impossibility of mastery may also prove immobilising for a beginning researcher. However, as Culler notes, this is "the condition of life itself" (p. 16), and the rewards of a researcher are not necessarily located at a specific destination, but in moving forward, testing knowledge and assumptions, asking new questions and seeing the world in different ways (p. 16-7). These comments are apposite in any number of fields, but they are particularly relevant to teachers, whose presence in the classroom implicitly indicates that they have achieved a level of mastery in their area(s) of study. Culler's reflections raise some interesting questions for teachers in all sectors—from early childhood specialists and primary teachers who are trained in a range of subjects and skills to high school teachers who specialise in discipline areas. It is the very nature of knowledge and theory—articulated by Culler—that provides the guiding question for this paper: What does it mean for a teacher to "know well"?

Despite the overwhelming support for a shift for teachers from "sage on the stage" to "guide on the side", it seems self-evident that teachers still need mastery over their subject. Ball, Thames and Phelps (2008) illustrate this point, explaining that the need to research content delivery was clear "[b]ecause it seemed obvious that teachers need to know the topics and procedures that they teach" (p. 395). This paper proposes that it is the seemingly "self-evident" nature of content knowledge that obscures a range of epistemic questions that could illuminate pedagogical issues and improve teaching praxis at all stages of career development.

The New South Wales Quality Teaching Model (QTM) (NSW DET, 2003) identifies three dimensions of quality teaching: Intellectual quality, Quality learning environment and Significance. The QTM breaks down the field of Intellectual quality into six areas: deep knowledge; deep understanding; problematic knowledge; higher-order thinking; metalanguage; and substantive communication (p. 9). Faull's (2009) paper on highly effective teachers draws on existing research to list six correlating characteristics in the domain of Intellectual Quality: 1) displaying a rich factual knowledge about teaching; 2) possessing an in-depth knowledge of subject matter; 3) having a rich procedural knowledge about teaching strategies; 4) currency of knowledge; 5) the willingness to be a learner; and 6) the encouragement of higher level reflection on metacognitive processes and products (p. 36). The purpose of this investigation is to build on Faull's research by unpacking three of these areas: an in-depth knowledge of subject matter; currency of knowledge; and the willingness to be a learner. The term "epistemic responsibility"—specifically, the imperative on a teacher to "know well"—will be explored within this framework.

Theoretical Framework

Epistemology is a branch of philosophy concerned with the sources, nature and scope of knowledge. More broadly, it can be usefully employed to explore "issues having to do with the creation and dissemination of knowledge in particular areas of inquiry" (Steup, 2013). Lorraine Code has made a significant contribution to this field of inquiry, most recently in her book *Ecological Thinking* (2006) which explores the political implications of an individual's claim to "know". Her earlier work, *Epistemic Responsibility* (1987), however, provides some guiding principals that can inform some of the issues raised in this paper. The book draws heavily on virtue ethics to tease out the implications of what it means to claim to "know well". Code argues that "knowing well" is a responsibility for any individual making a knowledge claim, and aims "to examine conditions

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for knowing well, not to provide a formula for acquiring indubitable knowledge" (p. 221). Following Code, this paper does not propose that formulas are necessary—or even possible—for establishing epistemic competence. Indeed, as Biggs and Tang (2011) write, "wise and effective teaching is not … simply a matter of applying general principles of teaching according to rule; they need adapting to each teacher's own personal strengths and teaching context" (p. 45). A key competency for individuals who would "know well" is, according to Code (1987), the capacity for reflexive epistemic questioning. She writes that only by having self-knowledge can one improve on it: "To strive for insight into the extent of one's own cognitive capacities, to distance oneself as much as possible so one can be critical of one's own knowing, is a crucially important aspect of epistemic competence" (p. 176). To this end, this paper will sketch some scenarios in which key epistemic questions can help a teacher define their position in relation to their content knowledge, and explore a practitioner's responsibility to "know well" according to stages of career development.

An additional theoretical framework defines the scope of this inquiry. This framework builds on Shulman's (1986) influential article "Those who understand: Knowledge growth in teaching". In this paper, Shulman asks some important epistemic questions: "What are the sources of teacher knowledge? What does a teacher know and when did he or she come to know it? How is new knowledge acquired, old knowledge retrieved, and both combined to form a new knowledge base?" (p. 8). Shulman's focus is located at the intersection of content knowledge translation into teaching practice. This area was termed pedagogical content knowledge, which, as the name implies, emphasises the interdependence of content knowledge and pedagogical praxis. Ball, Thames and Phelps (2008) helpfully build on the foundation set by Shulman. They identify sub-domains that differentiate between types of content and pedagogical knowledge for the purpose of analysis. Of these four domains: common content knowledge; specialised content knowledge; knowledge of content and students; and knowledge of content and teaching, this paper focuses on the first two: common content knowledge and specialised content knowledge. Ball et al. (2008) define common content knowledge as "the knowledge and skill used in settings other than teaching", and are careful to acknowledge that "common" does not mean "everyone has this knowledge". Rather, it indicates "that this

knowledge is of a kind used in a wide variety of settings—in other words, not unique to teaching" (p. 399). Specialised content knowledge refers to the knowledge and skill unique to teaching that belongs to a specific discipline.

A connection can be drawn between these four domains and the National Professional Standards for Teachers (NPST). The introduction to the NPST outlines seven standards grouped into three domains. Of these, common and specialised content knowledge can be mapped to the domain of "Professional Knowledge" and the first part of standard 2: "*Know the content* and how to teach it" ("NPST," 2011, p. 3 italics supplied). Each standard is mapped to one of four stages of a career cycle: Graduate, Proficient, Highly Accomplished and Lead Teacher. Interestingly, out of six focus areas in this standard, only one directly relates to common and specialised content knowledge: "*Demonstrate knowledge and understanding of the concepts, substance and structure of the content* and teaching strategies of the teaching area" (NPST, 2011, p. 10, italics supplied). This focus area clearly combines common and specific content knowledge with knowledge of content and teaching; again we see the area of content knowledge almost subsumed by its pedagogical counterpart.

This point is made explicitly by an analysis of the Self-Assessment Tool provided by the Australian Institute for Teaching and School Leadership (AITSL, 2013). The Tool is provided for teachers to informally self-review their professional progress against the National Professional Standards for Teachers according to their stage of career development. It is interesting to note that while "Professional Knowledge" is the first of three domains of teacher competency in the NPST, of the 74 questions in the survey, no question directly assesses the range or growth of a teacher's common content knowledge. It might be concluded that common content knowledge may be considered subordinate to other types of professional knowledge, but a more likely scenario is that it is assumed in the Self-Assessment Tool. As mentioned in a previous example, this may be because "it [seems] obvious that teachers need to know the topics and procedures that they teach" (Ball et al., 2008, p. 395). But again, if breadth and depth of content knowledge is so firmly embedded within teaching standards, should there not be specific questions that promote "transformative reflection" (Biggs & Tang, 2011, p. 45) in this area?

On the surface, exploring this domain of teacher proficiency might appear to be counter-intuitive. An academic degree, after all, confers a status of

> " *No [NPST] question directly assesses … a teacher's common content knowledge.* "

"teacher-readiness" on a graduate, and schools are entitled to assume that an experienced teacher's content knowledge has advanced and is continually growing. But how can such an assumption account for the graduate teacher who still feels "out of their depth" in terms of content at the end of their first year? Or a proficient primary school teacher who experiences anxiety about moving from a new entrants' program to teaching grade five or six content? That such teachers have the skills to acquire content knowledge is not at question here: the point is simply that the scope of new knowledge required by these teachers is, in theory, without boundary, and in practice, often assumed. Ball et al. (2008) note that much of the research carried out in this area has focused on gathering data about teachers' conceptual frameworks and how these translated into practice in the classroom (p. 393). This paper engages with the discussion at a different location; rather than providing examples of best practice at the point of instruction, the investigation focuses on reflexive practices at what will be termed points of "epistemic challenge". The aim is to probe some areas where knowledge is presumed or taken for granted, identify some potential triggers of "epistemic challenge" or crisis, and suggest some reflexive questioning examples to address such events. Each of these elements works toward answering the key question: What does it mean for a teacher to "know well"?

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Code in Action: A Case Study

Before applying Code's approach to the context of a classroom, a case study from *Epistemic Responsibility* (1987) will be outlined to illustrate the concept of epistemic responsibility. It raises a number of important issues and highlights some key epistemic points for scholars and practicing educators.

Father and Son: A Study of Two Temperaments (2004) is a memoir by Edmund Gosse. First published in 1907, the book contains Edmund's reflections on his childhood, and particular emphasis is given to his relationship with his father, Philip Henry Gosse. Gosse senior was a fellow of the Royal Society, a man of great intellect whose scientific peers held him in high esteem. At the age of 22 he had a powerful conversion experience and became a Christian. Much later Gosse courted and married Emily Bowes, a member of his deeply conservative faith community, the Plymouth Brethren. Emily also displayed a keen intellect and tirelessly wrote religious tracts until the time of her death when Edmund was just seven years old.

A predominantly self-taught scientist, Gosse senior is characterised by Code as a "painstaking and indefatigable researcher…a man well in touch with the current state of art in his area of expertise" (1987, p. 19). He encountered a significant epistemic crisis, however, when his faith was challenged by the concept of natural selection, communicated personally by Charles Darwin. While Gosse's scientific instincts were to investigate ideas, the perceived challenge to his religious convictions in this case determined him to have nothing to do with the new theory, and without further investigation, he clung to his existing view of the fixity of species (Gosse, 2004, p. 103). This decision was one in a chain of events wherein Gosse was ostracised by his scholarly community and the wider reading public; he subsequently broke ties with all elements of his life in London and moved to Devon. Gosse carried on his scholarly work, but the damage done to his reputation by his refusal to engage in serious investigation of new ideas was irreparable.

Code raises some key epistemic points in her case study of Gosse. Briefly, these are summarised in the following way:

1) that knowledge claims and efforts to know are events or processes in human lives; they emerge out of interaction amongst knowledge seekers, their communities, and the world;

2) there is no knowledge without knowers, no knowledge without context; and

3) that knowledge cannot be stored equally in a computer or a human mind, because people have attitudes to knowledge that shape both its structure and its content (p. 26).

Given that Code is writing from a liberal humanist perspective it is perhaps significant that she does not take issue with the integrity of Gosse's religio-scientific beliefs. She is careful to contextualise her critique within a complex web of factors that is unique to his situation. Gosse, she says, may be assessed as being epistemically irresponsible for not being open to the possibility of new knowledge for fear of eroding his own beliefs. "It is at least arguable," she writes, "that one who has examined alternative positions might be a better believer, in the long run, than one who has shied dogmatically away from them" (p. 22). What is at issue here is the creation/evolution debate losing a potentially powerful contender in Gosse, because his refusal to engage with Darwin's ideas—or gain content knowledge—necessarily excluded him from the scientific discussion.

A corollary and personal consequence of Gosse's desire to "know well"—but only in areas that matched his belief—is his son's rejection of Gosse senior's belief system and ultimate rejection of his faith. This result is of course unique to this situation, but the point is clear that epistemic responsibility has consequences beyond those that immediately affect the potential "knower".

This is perhaps nowhere more significant than in a classroom. Had Phillip Henry Gosse met his epistemic crisis with some personal reflexive questioning, perhaps a different outcome would have ensued.

Cooper (1993) uses Code's approach to construct some relevant epistemic questions that can be applied to different situations. He adopts Code's position that reflexivity is a key to epistemic competence and promotes the kind of Socratic questioning characteristic of intellectual virtue. These questions include: "Do I really know what I think I know?"; "Do I know enough to act as I do?"; "What don't I know?"; "What are the moral consequences of my knowing/ignorance?"; "Should I know more or acknowledge incomplete knowledge?" (p. 86). Applying the question: "Do I know enough to act as I do?" to Gosse's situation, an epistemically sound response would need to acknowledge that the act of rejection requires a thorough investigation of the subject before that action be taken. "Should I know more or acknowledge incomplete knowledge?" is also a relevant question. Gosse's refusal to investigate contrary viewpoints, his incomplete knowledge, prompted the disrespect—and in some cases, disdain and ridicule—of his peers. It may be concluded from Gosse's case that an epistemic crisis may be precipitated by a moral dilemma, lack of self-knowledge, failure to ask any (or the "right") epistemic questions, or any combination of these circumstances.

Two further points can be made in relation to this type of epistemic questioning. The first is the close connection between intellectual virtue and character. A responsibilist approach, Code writes, requires the character qualities of honesty and humility: "honesty not to pretend to know what one does not know (and knows one does not) or to ignore its relevance", and humility not to suppress evidence challenging to one's preconceptions (p. 137). She suggests that humility checks the possible excesses of "whimsicality" at one extreme of the spectrum and "close-minded dogmatism" at the other (p. 234). The second point is that accurate self-knowledge is crucial in any reflexive assessment of epistemic responsibility. This needs to be open to revision and reflection over time (p. 58).

To summarise, the key ideas that have been made are as follow: 1) there is a great deal of choice involved in knowledge acquisition; 2) this calls for epistemic responsibility on the part of the would-be knower; 3) reflexivity is a core epistemic competence; 4) knowledge-growth should be approached with an attitude of humility; 5) self-knowledge is vital to effective reflexive questioning; and 6) the inherent complexity of unique situations means that all epistemic challenges should be assessed individually. The remainder of this paper will discuss some

scenarios in the classroom which play out an epistemic challenge and explore some of the ways Code's approach might illuminate the situation and contribute to epistemic responsibility and professional growth.

Scenario 1

Richard is a first year teacher at a suburban secondary school. His subject specialty is mathematics and he is happy to be teaching a year 7 advanced mathematics class. During one lesson, a student asks Richard a question that may be asked in a number of mathematics classrooms: "When would I use this process in real life?" Richard responds that it is not the practical application that matters, but rather the acquisition of the skill that is important. The student appears dissatisfied with that answer, and Richard observes the student appears to have lost a little enthusiasm for the class. He finishes the lesson feeling some disappointment in himself and determines to come prepared with a better answer the next day.

This scenario requires a particular type of common content knowledge—it might be called "applied common content knowledge". Richard has always been interested in—and proficient at—mathematical processes for their inherent systematic integrity and was not able to answer the fairly common question regarding application. This epistemic challenge gives him a reason to enquire into a domain of professional learning for which he is not prepared. An assessment of epistemic responsibility might ask: "Given that Richard is qualified and demonstrably proficient in teaching the process, is he also responsible for providing an application for mathematical processes?" In the unlikely situation that curriculum specified only that students need to be proficient in undertaking mathematical processes, an argument could be made that Richard is not responsible for delivering content knowledge beyond process. But a responsibilist approach would suggest that, in fact, this is an important part of understanding. For Code, understanding

> involves tying one's knowledge down: relating it to a context, having some conception of the relation of this one "bit" of knowledge to the rest of what one knows. … Understanding, then, involves a just apprehension of significance and endorses an ideal of seeing things "whole" in some sense. (p. 150)

Further, she writes that "bringing to understanding … is as central a part of the commonability of knowledge as is learning the opening hours of the bank from one's neighbor" (p. 177). Again, of course it is unlikely that the curriculum and/or teacher proficiency standards would not address the application of such processes, but the point is that the demands of

Do I know enough to act as I do?

epistemic responsibility often go beyond prescribed norms and must be met according to the situation's particular needs.

Scenario 2

Rose has been teaching for seven years. Since graduating from university, she has taught new entrants and established herself as an early childhood specialist. However, as her school is experiencing unprecedented growth, she has been assigned a grade six class for the upcoming year to accommodate the need for a third stream at this level. This poses an epistemic challenge for Rose. She is known at the school as a competent and enthusiastic teacher and has recently won an award for innovation in the classroom. Rose experiences this change of classes, however, as a crisis, because she will be working with two well-established teachers who are familiar with grade six curriculum. They have a competitive, cordial professional relationship with each other, and while they are enthusiastic about Rose joining their team, Rose is not sure how she will fit into this active, slightly aggressive teaching environment.

The core concern Rose holds is that her knowledge base regarding grade six content is deficient. She has a wide range of professional, pedagogical competencies, but little to no understanding about how parliament works, is intimidated by mathematics knowledge required at this level, and is unfamiliar with a number of terms and processes involved in a science unit with a biological focus. A common-sense assessment of Rose's epistemic responsibility in this scenario would suggest that she simply needs to learn the content required for teaching this class and trust her colleagues to define the parameters of required knowledge for her. But Rose is a high achiever with a history of excellence in teaching and does not feel that this is enough. She understands the concept of "horizon learning"—that is, an awareness of how topics are related over the span of the curriculum—and is overwhelmed at the amount of new common content knowledge necessitated in linking back and forward to student knowledge. She is wondering if she should request being returned to her previous class. Are there any questions Rose can ask herself to assess her epistemic responsibility and set achievable goals for the year?

Given this scenario, a key question to ask is: "How much knowledge is it responsible to have for an experienced practitioner teaching new content?" Should Rose simply aim for the most basic common content knowledge acquisition? Here Code's reminder "no set of rules could be produced for specifying, incontrovertibly, what should be done in every kind of situation" is helpful, although "it is reasonable to assume that there are right and wrong answers to questions about these requirements imposed upon

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one's conduct, even though the answers may not be precisely the same for every knower" (p. 44). Of course, the requirements of the curriculum impose their own standards, but as outlined, Rose sees these as imperatives and has a higher expectation of herself than only meeting minimal requirements. Here the constraints of the situation impose different epistemic requirements on Rose than they would her more experienced colleagues. Teaching in the context of "horizon learning" is likely the stage at which her colleagues have arrived, but Rose's goals should be less advanced. However, given her achievements over the past five years, Rose might responsibly aim beyond the minimum requirements of this stage.

A helpful approach to take for Rose is to assess her responsibility in relation to her self-knowledge. Code writes that

> it is … sometimes easier to believe that one cannot master a certain subject matter (i.e. to delude oneself into believing that it is too difficult) than to acknowledge the accessibility of the subject relative to an accurate assessment of one's capacities and to tackle it. (p. 59)

Rose's aim might be an objective assessment of her current knowledge and capabilities: "one must know oneself to achieve a just estimation of the extent to which one does know, believe justifiably, deceive oneself, or fail in epistemic responsibility" (p. 59). As mentioned earlier, self-knowledge is open to communal challenge; Rose's own reflections might be helpfully modified by those around her who have a vested interest in her professional capabilities without the depth of subjectivity self-reflexivity inevitably assumes. That Rose feels the tension between her lack of common content knowledge and the demands of the curriculum indicates that she is exhibiting intellectually virtuous characteristics; the challenge in this case is to harness the energy produced by this tension to move forward into the challenge rather than let the demands of her new position overwhelm her.

Scenario 3

Sam is an experienced senior secondary school history teacher. He has been teaching for 35 years in a rural school. Sam has come to the point where, after many years in the classroom, things are just rolling along. He is respected by his colleagues and well-known and liked in the wider community. In accordance with Huberman's (1989) five stages of development, Sam finds himself in a phase of serenity and self-acceptance, and perhaps even beginning to disengage. Sam's knowledge is wide-ranging and he updates his curriculum documents to reflect changes according to the current departmental requirements,

but his content has essentially remained the same for a number of years. Sam figures: if it works, why change it? He encounters an epistemic challenge, however, when he glances at his class roll a week before classes start, and recognises a student as the grandchild of one of his first students from his graduate year. This gives Sam reason to pause. Is it possible that he will be teaching much of the same content—from a virtually unchanged knowledge base—that he taught this student's father? He wonders how different is that content from the subject knowledge he had as a graduate teacher. Sam realises that he is using many of the same resources he has been using for many years. What are some reflexive questions Sam can ask to assess his epistemic responsibility in this situation?

Sam might consider: What are the moral implications of teaching the same content over a number of years? What might this situation reveal about my beliefs regarding the nature of history and historical inquiry? What ideological messages does this send about the nature of history to my students? What impact might deeper and wider scope of knowledge have on my teaching?

For Code an epistemically responsible approach does include a degree of prudence, but to the extent that it produces excessive conservatism, prudence must be balanced by innovation. If a practitioner is "more concerned with avoidance of error than with creativity or exploration of new possibilities", or if a "knower" has settled into "complacency or inertia" (p. 56), as in Sam's case, this is potential an indicator of epistemic irresponsibility. Code acknowledges that there is a place for conservers of established practice among epistemic communities, but also notes that catalysts of cognitive change also play a vital role in such communities. The same principle applies to Sam's situation: his knowledge is valuable and should be acknowledged as such, but this epistemic challenge carries with it the potential for cognitive change which can enhance and revitalise his— and consequently his students'—experience in the classroom. Another possible outcome of epistemically responsible practice is the impact of Sam's action on his—ostensibly younger—colleagues. As Code notes, in an epistemic community

> outstanding achievement tends to stimulate emulators to go beyond it as much as it encourages them to approach its level as nearly as possible; and just as often, too, it provokes debate and challenge. There is an interactive process of inspiration and aspiration visible here, more reciprocal than circular. (p. 188)

This is supported by research that suggests mastery experiences of lead teachers can increase collective efficacy beliefs of their colleagues (see for example Goddard, Hoy, & Hoy, 2000; Protheroe, 2008).

Conclusions

A common thread running through each of these scenarios is that epistemic responsibility demands that a teacher be a lifelong learner. To any responsible teacher, this is not surprising. As Shulman (1986) reminds us, the division of "scholar" and "teacher" is a false dichotomy; he highlights that the academic titles "master" and "doctor" both have "teacher" at their etymological root (p. 6). But what these scenarios have attempted to show is that the demands of epistemic responsibility—and, indeed, intellectual virtue—require teachers to develop the capacity for highly reflexive self-assessment, informed not only by the demands of the curriculum and professional standards, but also self-knowledge and peer-assessment.

Philip Henry Gosse's situation demonstrates that it is, at times, easier to remain insufficiently informed. There are circumstances where it may be reasonable to maintain a conservative position after considering evidence. But Gosse's refusal to engage in thorough investigation of evolutionary theory deprived the critique of Darwinism of a deeply intellectual mind and a powerfully articulate voice. The principles of this scenario should not be lost on educators today.

The scenarios sketched in this paper demonstrate the fact that epistemic challenges can manifest situations as diverse as a brief classroom exchange, a major task reassignment, or a personal challenge to an established teacher. No matter what the context, a conscious choice to act with intellectual virtue is predicated on the ability to firstly recognise the challenge, and secondly work out the parameters of personal responsibility within a reliable reflexive framework.

The purpose of this paper has been to articulate the concept of epistemic responsibility and make an initial attempt to apply it to the classroom teacher. Clearly, its demands are different at progressive career stages, but the injunction to "know well" applies to all educators. Corollary questions may follow on from this exercise: What constitutes teacher expertise in a particular discipline? Is "expertise" a goal to be reached? An ever-elusive bar that shifts with each new domain of knowledge attained? A subjective standard that depends on context and personal experience? These issues could frame a future discussion which continues to tease out some of the implications embedded in the assumption that "knowing well" is a "given" for the classroom practitioner. **TEACH**

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