THE MALAYSIAN JOURNAL *of* QUALITATIVE RESEARCH

Editorial Board

In this issue

Preface

A declaration of ontological and epistemological assumptions that ground and direct the research process, including sample selection, methodological choice and transferability of results, has become more and more important in the world of qualitative research. In line with Guba and Lincoln, we believe that methodological questions are secondary to questions of paradigm i.e. the basic belief system and view of the world that guide researchers in a fundamental way. It was with this thought that the Qualitative Research Association Malaysia (QRAM) in November 2013, convened the 7th International Qualitative Research Conference in Shah Alam, Malaysia with the theme : *Doing It Right : From Theory to Publication*.

One of the aims of the conference was to encourage researchers to reflect on and consider these ontological and epistemological assumptions which consciously or unconsciously have directed their ways of doing research besides serving as a platform for researchers to present interesting, and original qualitative research papers. The Malaysian Journal of Qualitative Research (MJQR) was first published in 2007. This being the third issue, QRAM has the pleasure of presenting two such contributions from the conference.

Julie presents a thoughtful reflection on the issue that really hits the heart of scholarship and the role of theory in qualitative research using a simple three question approach. The importance of critical, analytical and creative thinking within qualitative research are highlighted. How the performativity and governmentality theory are used to examine the qualitative research that are shaped in the 21st century is well articulated in her paper entitled: *Shaping PhD Researchers: Fearless Intellectuals or Managed Employees?*

Currently mixed methods research is attracting increasing interest among researchers. In response to this trend, this issue include a study that is qualitative driven mixed method design as we believe this will provide another dimension to 'a mixed methods way of thinking' that is 'open, seeking richer, better understanding of important facets of the phenomena'. This initiative is part of a continuing dialogue about how an integration of qualitative and quantitative inquiry can be reported in response to questions arising inductively.

The article on 'Making *Sense of Mixed Method Design in Health Research: Reconciliation of the Findings in a Study of the Doctors' Decision Making Process in Engaging Male Patients in Health Checks'* illustrate how the qualitative findings from a grounded theory approach complement the findings from the qualitative survey thus providing a more complete picture of the doctors' decision making process when engaging male patients in their health checks. With this paper Seng Fah has given us that very epistemological key with which we can open into the deep secret of how to understand the individualistic nature of qualitative approach and normative nature of quantitative approach.

As researchers we want to find out what we cannot see with our eyes and what is not observed directly e.g. people's thoughts or feelings in specific situation or what different phenomena mean to them. Thus in qualitative research, interviewing is the dominating way of collecting data. Unfortunately, much interviewing is done rather badly without coming close to

informants' inner thoughts. This is a big concern as good analysis are only predicted by good data.

Based on her doctoral study on '*Science Students' Self-Generated Analogical Reasoning of the Concept of Translation in Protein Synthesis'* Maria shares her journey in how she planned and implemented qualitative interviews. The importance of establishing rapport and being prepared is highlighted. In addition, how she managed the interviewing session is detailed and useful advice is included in her paper. The need to practice many times was emphasised in order to perfect the art of interviewing.

Soon Boon's article, *'Conception of Thoughtful Teaching by Four Master Teachers in Malaysia'* explores how teachers teaching the Revised Secondary Science Curriculum (RSSC) implement the curriculum using case study design. The outcome of the study revealed that each of the participants has their own distinct characteristics and strategies of teaching. Major principles in RSSC were adhered to but not the prescriptive model provided by the Department of Education. The study demonstrated a need to realise and acknowledge that teachers' personal characteristic plays a part in deciding how to teach and in determining the effectiveness of their teaching.

The expansive field of qualitative research, offers an exciting possibility to generate meaningful knowledge from individuals' experience and to illuminate the basic social process that explained events on a deeper level as illustrated by the above articles. There are still many interesting research questions waiting for exploration in - depth by interested and competent qualitative scholar.

One of the aims of the journal is to strengthen the awareness and impact of qualitative research and its conduct. It is not an easy job owing to the domination of paradigm that favours numbers. Nevertheless, who says that it must be easy? Researchers are extraordinary well educated people and know how to work hard. We must continue to gain insights into the ontology, epistemology and methodology of qualitative research works.

 Although the journal is still a new journal to many researchers within the country and around the world, we hope that together, the authors, editors, readers, reviewers and editorial board members will influence colleagues and researchers the world over to send manuscripts to the journal. We also hope that the contents of this third issue of the MJQR has provided readings that is worth considering and has contribute to methodological awareness.

We would like to thank all the reviewers for their excellent work and the authors for their contribution. We expect that MJQR will soon be indexed with SCOPUS, which will provide a higher platform for the authors and the readers, with a comprehensive overview of the most recent developments in qualitative research.

The Editorial Board
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Shaping PhD Researchers: Fearless Intellectuals or Managed Employees?

JULIE WHITE

ABSTRACT

How PhD candidates learn about scholarship and how they and their supervisors face an increasing threat of becoming managed within the risk-averse environment of the modernized university is the focus of this article. The main purposes here are firstly, to highlight the importance of critical, analytical and creative thinking within qualitative research. The second purpose is to use performativity and governmentality theory to examine how 21st century researchers and qualitative research are shaped. Drawing from policy studies, social theory and higher education literature, this article has significance because it articulates what everyday pressures in higher education mean for scholarship, thereby making an original contribution to the international and interdisciplinary field of contemporary qualitative research.

Introduction

This discussion begins by considering the expectations made of scholars in these times in order to examine the central issue of how newcomers to the academy are affected by performativity and governmentality in their learning. Secondly, the significance of critical and analytical thinking within research is discussed. A simple three-question approach is proffered to support the argument about the importance of theory in contemporary qualitative research. The article focuses on ways in which PhD candidature and supervision processes have become managed and how researchers may themselves contribute to this. The overall purposes are to argue the importance of theory in qualitative research and to raise concern about how researchers are shaped in the modernized university. The consequence for individual researchers, particularly in relation to international publication, is considered towards the end of the article.

Becoming a scholar

In this first section consideration is given to what is involved in learning about scholarship and how environment and expectations impact on scholarly work. The main purpose here is to establish a suitable context for the arguments subsequently forwarded.

In her study of mentoring and early career women academics, Devos (2005) examines what is involved in becoming a researcher. She characterizes this endeavour as a far more complex process than just the acquisition of new skills and knowledge and argues that it involves instead, the taking up of new identities. Beck and Young (2005) also point to the development of professional identity requiring the creation of professional habitus, which goes well beyond the development of knowledge or skills. As I have argued elsewhere, how academics 'perform' their scholarly identities accords with institutional expectations and environment (White, 2012).

Expectations of senior scholars in the modernized university have become increasingly explicit through government research exercises and international comparisons and rankings. From

Europe, Räsänen (2008, p.1) succinctly outlines the expectations he faces as a senior member of the academy:

> I publish in the ''top journals'', gain an international reputation as a key academic of my field, attract significant amounts of funding from public and private sources, teach more courses than previously in each academic year and in a way that pleases Finnish and ''international'' students, supervise world-class dissertations, remake myself into a nationally respected and influential figure, keep up my and the school's brand in media, and contribute actively to the school's governance in various bodies and taskforces.

The main interest in this article in this description of the expectations Professor Räsänen has identified as making up his scholarly work, lies not so much in the thinly veiled criticism he levels, but in the explicit account of his work. How newcomers to the academy learn how to translate what is expected of them into their scholarly work is of interest here.

Traditionally academics have been expected to contribute to knowledge and to the greater good (Rizvi, 2008; Shore, 2010) as public intellectuals and work practices in universities tended towards collegiality and autonomy (Clegg, 2008). Outside one's own institution, identity was defined in terms of reputation that was upheld by a system of peer review, publications and service. Academics have traditionally been judged by the standards set by their discipline or field, not by the institutional needs of their employers. Rizvi (2008, p. 120) draws on Said's views on intellectual public responsibilities to argue that scholarly work involves: 'Raising embarrassing questions publicly, confronting orthodoxy and dogma, avoiding cooption by government or corporations, and most importantly, representing the people and issues usually forgotten or hidden.'

Interestingly however, academic 'service', the third strand of traditional scholarship after teaching and research, seems to have become commandeered by employing institutions and has come to mean administrative work that serves the university's needs, rather than those of the individual academic (see White, 2012). Contribution to wider research community, through such activities as peer review, editorship of journals, organization of conferences and participating in learned societies and disciplinary associations have become undervalued and relegated to hobby or weekend work. Time allocation and credit for these activities as core academic work has disappeared from workload formulae in many universities. While demonstration of these service activities are required for promotion and tenure processes, their value seems to have been diminished for employing universities.

While the work of academics has intensified, the focus for most remains on teaching, research and service/administration. Universities are particularly hierarchical organizations, but at each level from the PhD student through to the lecturer levels, up to the professoriate, considerable pressures exist as summarized by Professor Räsänen. How individuals respond to these pressures varies, but the values, beliefs and practices of individual scholars become shaped through their responses. How this impacts on PhD candidates is of particular interest here and how they are shaped into academic work and identity is addressed throughout this article. Theories of performativity and governmentality assist in this discussion and will be outlined shortly, after consideration is given to the kinds of thinking required within contemporary qualitative research.

3. Critical, analytical and creative research thinking

So far in this article I have begun to describe the modernized university by highlighting what seems to have changed in recent times regarding expectations made of scholars. I have also included some comments and references to the work of other scholars who have written about these issues. Using the Three Question Approach, (Hay and White, 2007), I have been addressing the first two questions:

1. What happened?
2. How do you know?

However, it is the third question that has the most significance for the work of academic researchers:

3. What does it mean?

And this question is important because it demands interpretation, analysis, critical thinking, creativity and providing something new to what is already known. And contributing to what we know about the social world is crucial for those of us who undertake research in the social sciences and the humanities.

There are many theoretical conceptions of what constitutes creativity, but it is Feldman, Csikszentmihalyi and Gardner's (1994) notion of creativity being characterized as 'going beyond' that is pertinent here. By attempting a response to the third 'What does it mean?' question, the researcher isn't required to provide definitive or 'correct' answers. Nor are they required to demonstrate their diligence and hard work (See for example, Alvesson and Sköldberg's (2000) critique of grounded theory). Rather the researcher is required to analyse differently and to add something new, in order that the work makes a unique contribution. By moving beyond the safe and the known, researchers thereby advance knowledge and research practices by fresh theoretical exploration and explanation, and in the process employ creativity to go beyond what is already known.

My argument here is that traditional qualitative research was distracted away from sufficiently addressing the third question. In the early days of qualitative research, in the late 1980s and early 1990s, it was seen as radical and daring and much time and energy was spent on arguing and attempting to prove that it was a legitimate way to undertake research and that qualitative approaches were rigorous and defensible. Key questions of validity and reliability were addressed through increasing attention to rigour in procedure and technique. Others like Richardson (2000) and Lather (1986) wrote influential texts addressing validity and goodness criteria in research that employed theory, but these seem to have been overlooked by those who continued to focus on method. Over time, increasingly sophisticated computer programs were developed to support complex coding procedures, following the establishment of research themes, with the capacity to aggregate more and more data – but the focus tended to remain on procedure and method for many, rather than theory, interpretation, meanings or contribution to knowledge about the social world. And to refer again to the 'Three Question Approach' (Hay and White, 2007), tend to ignore the third question: 'What does it mean?'

Since those early days, qualitative research has evolved to such an extent that to even refer to qualitative research as a singular venture no longer makes a lot of sense. As Denzin and Lincoln's (2011) seminal text demonstrates, what counts as qualitative research is extensive and diverse. Postmodern theory has been important within this transdisciplinary field of qualitative research, with doubt and questioning of truth claims taking precedence over technique and procedural concerns of the past. Rigour remains central in the field of

qualitative research, of course, but proving that one has ascertained the truth, through one's research, is no longer the point. As Richardson (1990, p.10) pointed out twenty-four years ago:

> social science writing depends upon narrative structure and narrative devices, although that structure and those devices are frequently masked by a scientific frame, which is itself a metanarrative (See Lyotard, 1979). Although a life is not a narrative, people make sense of their lives and the lives of others through narrative constructions. In our work as researchers we weigh and sift experiences, make choices regarding what is significant, what is trivial, what to include, what to exclude. We do not simply chronicle "what happened next," but place the "next" in a meaningful context. By doing so, we craft narratives; we write lives.

Richardson makes the salient point here that researchers make many choices about how their research findings and data will be written, and what will be emphasized and addressed and what will be ignored. Richardson implies that truth claims are consequently diminished. Qualitative researchers are required to be reflexive (Alvesson and Sköldberg, 2000; Pillow, 2003) by acknowledging their worldviews, epistemologically and ontologically, and to be clear that their work is partial, situated and usually relates to a small sample. The capacity to replicate and generalize, as seen in the tried and true validity and reliability processes of experimental research - or the sampling and statistical procedures of survey methodology, do not apply within contemporary qualitative research. Our work cannot be generalized, nor can it be replicated, and therefore qualitative researchers need no longer argue this case.

To put it another way, traditional qualitative research tended to focus its energies on addressing the first two questions, 'What happened?' and 'How do you know?' emphasizing rigour in process and diligence, in order to claim legitimacy and parity with quantitative research. More contemporary approaches assume this legitimacy and tend to focus instead on the third question, 'What does it mean?'

Boden, Kenway and Epstein (2005) stress the importance of theory in research, asserting strongly that, "Research without a theoretical framework is description and does not qualify as academic research or as a contribution to knowledge" (40). Further, they urge researchers to be open and explicit, in their research proposals and theses, about their epistemology and ontology, commenting that:

> We do not believe that any knowledge is 'objective' or that researchers can take a god-like stance as knowers. It is therefore important to be clear, up-front and honest about your ontology and epistemology in your research. This will enable your readers to understand where you are coming from and to make a judgment on the quality of your work based on that understanding. Saying who you are and where you are coming from will not stop people who genuinely believe in the possibility of 'objective truth' from criticising you for you have been honest about your subjectivity and partiality. And remember, subjectivity is not and should never be synonymous with lack of rigour. Being clear about your frameworks is part of that rigour (p. 41).

This offers a coherent response for those who continue to question the value of qualitative research or who dichotomize qualitative and quantitative research as diametric opposites. Quantitative research has stood the test of time and is highly appropriate for some research questions, whereas qualitative research has grown from its uncertain adolescence into confident and stable adulthood where diversity is perceived to be its strength. The

international debate long ago moved on from 'quant' versus 'qual', or 'good' versus 'bad', and few journal editors would accept articles that address this. Nevertheless, rigour and disciplined inquiry is required in all research and fidelity is required between paradigm and methodological expectations. And theory is required.

While everyone has an epistemology or worldview—the knowledge systems that explain how the world works—the more rigorous epistemology of researchers is called 'theory' with researchers being required to be explicit and clear about theoretical frameworks we use in our research. Questions that assist here include: What does it mean to know something? What is the difference between knowledge and opinion? "How can we use our reason, our senses, the testimony of others, and other resources to acquire knowledge?" (IEP, 2014). Social theory provides us with readymade finely crafted epistemologies that allow us to think more analytically, critically and creatively about our research. When Foucault wrote, "I would like my books to be a kind of tool-box which others can rummage through to find a tool which they can use however they wish in their own area" (1974, p. 523), he provided researchers with a range of lenses and perspectives for us to choose from. Later in this article I have chosen his tool of governmentality to assist thinking about and articulating constraints on PhD candidates and their supervisors. I have also chosen Lyotard's (1984) conception of performativity as it proves helpful for thinking through the issues under discussion.

Jackson and Mazzei (2012, pp. vii-viii) take the importance of theory further in relation to qualitative research and, in the process, question time-honoured and everyday research practices. They make a strong assertion and challenge dominant practices in much traditional and contemporary qualitative research. In this way they make a substantial and new contribution to knowledge, in the qualitative research field. And as a new perspective, it is a somewhat uncomfortable one that nevertheless provokes thought and leads to new practices and understandings:

> qualitative data interpretation and analysis does not happen via mechanistic coding, reducing data to themes, and writing up transparent narratives that do little to critique the complexities of social life; such simplistic approaches preclude dense and multi-layered treatment of data. Furthermore, we challenge simplistic treatments of data and data analysis in qualitative research that... reduce complicated and conflicting voices and data to thematic "chunks" that can be interpreted free of context and circumstance.

Boden, Kenway and Epstein (2005, p. 41) also assert, "You cannot make sense of your data without an epistemology/theory". St Pierre (2011) has offered a significant contribution to this discussion about qualitative research and the importance of theory, so it will not be pursued much further here. Suffice to say that contemporary qualitative research requires specificity regarding theoretical frameworks employed and theorized justifications for research conclusions. Thus employment of theory in contemporary qualitative research is crucial, unlike earlier traditional approaches where methods and procedures assumed greater importance.

How data is viewed, conceptualized and used in research within the contemporary context has become increasingly complex. However, many methodological textbooks in qualitative research continue to be published without due consideration of theory. Library shelves groan under the number of 'how to' technical and method-focused textbooks that have been published, revised and reissued since the early 1990s. However, journal articles are rarely accepted these days without theoretical contribution. This point is taken up again later.

Theory tends to be sidestepped in contract research where those commissioning projects require straightforward and accessible results. Contract research, particularly for governments, is preferred in uncomplicated, definitive forms, such as survey results. Qualitative research has become increasingly complex, which can lead to difficulty in relation to contract research. The challenge for the contemporary qualitative researcher might be equated to that of the novelist or artist. Is critical or popular acclaim of greater value? Is having your work valued by international peers, who read your articles in prestigious journals important? Or does bringing contract research money into your university have greater importance? It's a dilemma most researchers face at some point.

In the next section the concept of new managerialism and the modernized university is taken up, in part to examine the importance of external funding and its impact on scholarly work.

New Managerialism

In this section the ways in which universities are changing is considered using the concepts of 'new managerialism' and being 'managed' in the modernized university. This provides a firm footing for consideration of the constraints for PhD students and their supervisors and the shaping of scholars and scholarship.

Rosemary Deem (2001) provides an explanation of new managerialism that is helpful within the context of this discussion:

> New managerialism usually refers to practices commonplace in the private sector, particularly the imposition of a powerful management body that overrides professional skills and knowledge. It keeps discipline under tight control and is driven by efficiency, external accountability and monitoring, and an emphasis on standards.

Under the new managerialist regime, higher education has come to value tangible financial income above scholarly measures of quality. For example, Shore (2010, p. 23) notes how 'Auckland University' measures its success in terms of income. The most valued research projects, he argues, are those that bring money into the university. Further, success means PhD completions—for which universities receive government funding—and increased enrolments. 'Making money has evidently become not only the university's "highest ambition", but also its most important...measure of success.' It should also be noted here that government funding has steadily decreased for universities in most countries, while student numbers have significantly increased as a result of massification. This adds to the pressure faced by the contemporary researcher to choose whether to value publication or contract research more highly.

The term 'managed professionals' has been used to refer to the way teachers have become positioned and undermined by government (Codd, 2005). An enduring conception of what it means to be a professional retains three key elements: autonomy, knowledge and responsibility, argue Furlong, Barton, Miles, Whiting and Whitty (2000) who quote Hoyle and John's earlier work on professionalism:

> As professionals work in uncertain situations in which judgment is more important than routine, it is essential to effective practice that they should be sufficiently free from bureaucratic and political constraint to act on judgments made in the best interests (as they see them) of the clients (p. 5).

The managed professional, in contrast, has been characterised as having 'specified competencies, is extrinsically motivated within a contractual relationship, and produces what the performance indicators can measure' (White and Openshaw, 2008, p. 34). The discussion here considers the extent to which academics have also become managed professionals, with professional judgement and independence playing a lesser role to new managerialist demands enforced by department managers. This, in turn, has potential to impact on the departmental environment and on supervision processes and practices as part of contemporary scholarly life that requires compliance and adherence to performative values.

So the argument that scholars are increasingly managed professionals working within new managerialist universities will now be extended. In the next section the ways that the work of academics is shaped by performativity and governmentality is outlined. This is followed by a key argument that the newcomers to the academy, PhD students, are inescapably shaped by their environment and by performative expectations of them and of their supervisors.

Performativity

Francois Lyotard (1979/1984), the French philosopher, uses performativity to explain and represent political and bureaucratic mechanisms of control. Performativity refers to the drive for the achievement of goals in increasingly efficient and instrumental ways. For Lyotard, performativity represents the attitude of valuing the 'effective' and the 'efficient' in systems where the least 'input' produces the greatest 'output' (Burnard and White, 2006). As Davis (2004, p.75) pointed out, 'The principle of performativity may not be entirely bad in itself. There may be nothing wrong, for example, in trying to get a car to burn less fuel and thus to produce a better performance for less output'. However, performative practices, Lyotard predicted, could lead to a situation when factors that cannot easily be measured and do not readily fit into the performative system can be ignored or denied. Lyotard heralded a time of 'terror' when performativity takes over. Ball (2003) took up this issue in relation to teachers, suggesting that this time of terror had arrived.

Performativity theory allows us to observe that academics are driven to perform against predetermined measurements in teaching and research and quotas for scholarly publication outputs have been devised that academic researchers are required to attain. This emphasis on publication quality does not necessarily extend to consideration of important ideas, contribution to knowledge or influence on other scholars, leading to knowledge production processes based on metrics devised by publishing houses and higher education bureaucrats, rather than scholars. Sparkes (2007) provides a chilling account of his work in the UK as research director that illustrates this point.

Therefore, a rhetorical version of quality appears to be behind the wheel, with contribution-to-knowledge being asked to take a back seat. In the next section, Michele Foucault's later work on governmentality is briefly examined to see how this theory can be put to work in this discussion.

Governmentality

Performative measurement and values relate to the different aspects of academic work. In the research sphere, academics are stratified and judged by others regarding their research capability with many universities classifying their researchers as 'research active' or 'inactive'.

In teaching, performativity operates through student evaluations, and by academics being encouraged into using sanctioned approaches and incorporating standards, technologies, capabilities and skills into their assessment of learning. The process of academics disciplining themselves to comply and to deliver what is expected of them demonstrates governmentality.

This concept can be helpful to consider the relational nature of power by examination of how someone else's activities can be shaped and how this is achieved. Governmentality works through social technologies where the government itself has become distanced (Donzelot, 2009) while responsibility is delegated and in the context of this discussion, it is individual universities and departmental managers that have assumed this responsibility. Making sense of how academics have been transformed into a more compliant workforce is supported by investigation of this aspect of power identified through governmentality. The strategies, tactics and technologies employed by the more remote government remain, but also present are technologies of the self (Lemke, 2009) where academics, in their freedom, comply.

As Devos (2005, p. 10) suggests, 'a central feature of governmentality is the way in which one takes up the project of managing one's own conduct within the prevailing conditions'. Self-managing academics work to continually 'reconstruct themselves and adapt, and 'simultaneously internalizing and rejecting the performative' (Blackmore, 2003, pp. 5–6). Governmentality is therefore, the way that systems are established and expectations made explicit, so that academics end up governing their own behaviours. In so doing, academics acquiesce, thereby relieving department managers and university administrators of the need to explicitly direct the work of scholars. And this is because academics second-guess what is expected and toe the line, without being asked to do so.

One of the central arguments in this article relates to the ways in which academics and scholarship have become shaped in the modernized university. Governmentality and performativity are two theoretical concepts that assist in this discussion about the extent to which scholarly work is managed.

The new academic has usually improved and fashioned themselves in accordance with what is required before they are employed as well as continuing self-improvement during employment. Throughout the doctoral candidature period, individuals become encultured into the ways and norms of the academic department and discipline or field. Many doctoral students aspire to work in universities or wish to retain their positions in universities and so work to anticipate what is required and improve themselves accordingly.

Self-improvement of academics through seminars, courses and support programs is regularly encouraged in the modernized university. Weekly bulletins advertise lunchtime seminars on how to write prestigious grants applications or how to get publications completed and accepted. Teaching and learning units offer courses on how to teach in ways that are preferred and sanctioned by their universities. Further encouragement is provided for academics to attend such courses as their completion is often now required in promotion processes. Support has become increasingly available to improve lecturers' use of ICT in teaching and courses on managing staff and budgets are also on offer in the modernized university. These courses are designed to support government priorities and university operation. They require academics to continually improve the self and have replaced scholarly service that looked outwards and emphasized disciplinary contribution and collegiality.

While there is an appearance of agency within governmentality, there is nevertheless a significant issue of overwork becoming somehow normal for academics—especially for those with substantial administrative or teaching responsibilities. By continually meeting publication

deadlines and developing grant applications (Davies & Bansel, 2005) academics manage to retain research agendas and meet teaching and administrative commitments. However, they do this in their own homes where they sit, transfixed, at their computers in the evenings after the administrative work is done and emails from students have been answered. Research work is often undertaken on weekends and during holidays and usually remains invisible.

The point of taking up this idea of governmentality—where academics overwork and discipline themselves to conform to expectations and performative requirements—is that in the process, they could easily influence and shape their PhD students to become timid, overworked and compliant academics, rather than Rizvi' (2008) version of a scholar who sees their role to be one of, 'Raising embarrassing questions publicly, confronting orthodoxy and dogma, avoiding cooption by government or corporations, and most importantly, representing the people and issues usually forgotten or hidden.'

Why scholars routinely work unreasonable hours to meet unreasonable expectations, and do so quietly and in secrecy, is explained and understood through governmentality. In the next section, how performativity and governmentality work within doctoral education is addressed.

Doctoral candidates and their supervisors

In university bookshops many simplistic texts on how to 'do' a PhD are available. These are written for doctoral students who are presumed to be nervous and in need of these how-to manuals. In these texts, research and complex social theory is eschewed. Instead, they tend to concentrate on the mechanical and the predictable, thus making the PhD project appear to be a straightforward one. These books tend to specialise in presenting common sense versions of technique, thesis elements and work habits, instead of the complex identity and intellectual work that is actually involved in completing a PhD.

However, the scholarly literature on doctoral education presents a different perspective. Doctoral education and the doctoral experience is a growing international field of research, with a significant focus on identity, the supervision process and the writing of theses (see detailed summary in White, 2013). However, it was Connell's (1985) seminal article, *How to supervise a PhD,* that conceptualised supervision as a highly sophisticated form of teaching. Connell (in Connell and Manathunga, 2012) later characterised this early article as a 'call to conversation' about the supervision process. As Connell (1985, p. 38) noted:

> supervising a research higher degree is the most advanced level of teaching in our education system. It is certainly one of the most complex and problematic - as shown by the very high drop-out rate of students at this level. It is also one of the least discussed...The relationship with a supervisor is different from that between two academic colleagues working on a related research project. It has to be seen as a form of teaching. Like other forms, it raises questions about curriculum, method, student-teacher interaction and educational environment.

It is this point about educational environment that is of particular interest in this article. Deem and Brehony (2000) also signalled the importance of community and environment for the PhD candidate and Evans (2013, p. 511) notes that a doctoral program should equip candidates 'with skills, knowledge and "cultural capital" with which they can shape their futures', which points to the complexity of the learning and development undertaken by new scholars and the importance of the environment and values absorbed during PhD candidature. Grant (2005)

outlines the complicated tripartite pedagogical and power relationship between the supervisor, the candidate and the production of knowledge via thesis development, and points to the complex ways in which the academic and the personal can overlap in this long-term project. This develops and extends Acker's (2001) notion of ambiguity in the supervisor-candidate relationship. But as Cribb and Gewirtz (2006) observe, this is increasingly undermined by an audit regime of performativity. As Devos and Somerville (2012, p. 54) point out, 'candidate, supervisor and administrator subjectivities are constituted within complex webs of institutional and discipline-based regimes of power'. This power is of interest in here, particularly the power exercised by managers and the impact of this power enactment on doctoral education curriculum, relationship and the pressure to conform.

Research that employs qualitative approaches usually resides within the social sciences where research 'culture' refers not only to specific disciplinary practices, but also to student and academic life. Whereas in the physical sciences, the PhD project is usually part of a larger funded study, and supervisors and immediate research community work side-by-side within the same laboratory; in the social sciences, PhD students can be isolated and meet with their supervisor only occasionally. Professional doctorates usually have an extensive taught component and collegial connections can be made within these classes, which is often not the case for PhD candidates, especially for those who are enrolled part-time. Formal and informal research education as well as social and cultural experience within the academy for PhD students has long been considered important (Deem and Brehony, 2000). The place of department courses and seminar programs—where students have the opportunity to learn about methodology and theory, present their work, hear and contribute to critique the work of others—is also generally considered a significant aspect of the research education program for PhD candidates. The social connection with other students is crucial for many, while developing collegiality with department and visiting academics is important in the overall development of scholars at this level. Deem and Brehony (2000, p. 158) suggest that:

> Academic research cultures include disciplinary or interdisciplinary ideas and values, particular kinds of expert knowledge and knowledge production, cultural practices and narratives (for instance how research is done, and how peer review is exercised), departmental sociability, other internal and external intellectual networks and learned societies. Whether students in the social sciences can and do access all this seems to depend rather a lot on chance and supervisors.

Acker (2001, p. 62) points out that the doctoral student needs to become attuned not only to disciplinary ways, but they must also become socialized into the values and practices of their departments. Of particular interest is the pressure of time and how this affects the PhD student from participating fully in rich departmental life, if indeed it remains on offer in the present environment of performative requirements and managed academics.

The pressure wrought upon the scholarly community begins with expectations of PhD students. In many countries in the global south, colonial attitudes make a PhD earned elsewhere, like the US or the UK, of greater value than a local one. This attitude prevails in Australia and New Zealand and may be related to practices like the requirement for PhD students in some Malaysian universities to have two journal articles published before their PhD can be awarded.

In Australia, the recently established educational standards for further and higher education summarize the learning at doctoral level as: 'Level 10: Graduates at this level have a systematic and critical understanding of a complex field of learning, and specialized research skills for

the advancement of learning or professional practice' (Australian Qualifications Framework Council, 2011, p. 4).

Expectations on the length of time it takes to complete a PhD have considerably reduced in recent years. Connell (1995) estimated 4-6 years, but most official requirements are now 3 years, in some cases up to 4 years. Most doctoral candidates in my field of Education are part-time, older due to considerable experience in professional practice, and female, reflecting the gender skew in the teaching profession. The establishment of 'normal' timelines for doctoral completion by university committees works against most candidates in this field such as this because, as Cribb and Gewirtz (2006, p. 234) observe:

> Firstly, in large measure, the problems we are describing can be seen as a product of the nature of audit, especially its reliance upon blanket rules, timelines and systems of monitoring. As things stand, it is arguable that the prevailing governance procedures embody a strong conception of the 'normal' Ph.D. student as someone who is likely to be young, academically privileged, undertaking a science doctorate, full time (and possibly male)...such procedures may suit individuals only to the extent that they correspond to this norm.

New managerialist decision-making on the part of departmental managers also attempts to relieve departmental budgets of the burden of students in 'lapsed candidature', for which neither the department nor the university will receive money. This returns us to Shore's (2010) extreme examples from New Zealand, which offer a relevant, but scary perspective on the future. So performativity helps us to understand the reduced length of candidature, here, but what impact does this have on the supervisor-candidate relationship?

Doctoral supervision requires an inordinate amount of time writing progress reports for departments and for university-level structures, in addition to reports and letters for sponsoring agencies. By ensuring that these documents are written, that progress presentations are given and milestones are met, the supervisor can be kept busy with administrative tasks. Lyotard's (1979/1984) conception of performativity, involving excessive accountability and achieving more with less, resulting ultimately in terror, no longer sounds unreasonable. Moreover, some provincial universities are now counting PhD supervision as part of the supervisor's research work time, which seems to be a cynical performative exercise, producing substantially more with less. The pressure on academics to list timely completions as part of appraisal and promotion processes, as well as demands to sit on the panels of students presentations and committees within one's department, and examine theses from other universities can become onerous. The work of academics has intensified significantly in terms of teaching loads and administrative responsibly, as well as the pressure to undertake and publish research, and this has been well documented (for a detailed account of this see White, 2012). This intensification of academic work may also result in academics having less time for the education of their doctoral students.

The environment in some university departments has become diminished in terms of doctoral learning for both local and international students. In the context of Acker's (2001) points about important elements of doctoral education (see above), some university practices that demonstrate the result of performativity, governmentality and poor departmental leadership involve:

- enrolling students in professional doctoral programs, but not providing classes for them
- not providing research seminars for staff or doctoral students
- neither funding nor encouraging visiting scholars

- providing no departmental-level classes or support for PhD or professional doctoral candidates
- counting higher degree supervision commitment as the supervisor's research time
- overloading academic staff with supervision responsibilities
- denying requests for conference travel funds for doctoral students
- keep academic teaching staff busy by changing their heavy teaching loads annually (White, 2013).

These practices impact significantly on departmental life, culture and doctoral education. In an impoverished research environment where this sort of practice occurs, questions arise about how doctoral students should undertake their complex tasks. Without access to scholars beyond their supervisors, how are they to access current ideas and debates at the local, national and international levels? While doctoral students are expected to read extensively and many participate in online forums, the publication lag for significant journals presents difficulties of currency. Moreover, in such an environment, the responsibility of supervision becomes heavy, and without nourishment or collegiality, it becomes unreasonable.

Departmental managers are routinely required to make budgetary cuts that impact on programs and research opportunities in order to meet performative demands and financial targets. At an extreme end, this has the potential to result in research environments that are distressed and impoverished, which in turn may consequently diminish important learning and development opportunities for doctoral candidates, particularly in terms of culture and environment. As Green (2012, p. 11) observes: 'The Australian university in the early 21st century is highly corporatized and strikingly performative in its orientation and conduct, and desperately underfunded'. Nevertheless, there remains discretionary power about how policy and budgetary constraints are interpreted and enacted, with decisions about workload and priorities residing with department managers. However, those with least scholarly experience and knowledge—those who have chosen an administrative academic path—may inevitably make decisions that have the greatest impact on scholarly endeavour, including doctoral education. And in the worst-case scenario, in an environment where academics have become 'managed' to the extent that they comply and align, it may be that department managers opt to use funding, workload and supervision responsibility to reward and punish.

Publishing Qualitative Research

If PhD students are rushed into completing their theses in short periods of time, then the reading and time required for examining and applying complex social theory may not be included. PhD theses may use older versions of qualitative research and not make sufficient use of theory. However, these same individuals will be expected, upon employment, to publish, but prestigious and highly ranked journals in the qualitative research field don't usually publish method articles that are descriptive or that fail to provide new contributions to knowledge. Journal editors in most fields only accept articles that 'go beyond' (Feldman et al, 1994) what is already known. A cursory scan of the 'aims and scope' section of academic journals readily confirms this.

Until recently, I was editor of the *Qualitative Research Journal* to which articles from many disciplines and using many different approaches are routinely submitted. In general, it is increasingly difficult for editors to obtain peer reviewers and I can only surmise that performativity and new managerialism, together with a diminishing status of disciplinary

service is to blame. During one memorable six-month period in 2012 I tried vigorously, but ultimately in vain, to obtain peer reviewers for an article that reported on an interesting topic and used grounded theory. After my request was refused by 35 academics, from 5 different countries, I was compelled to heed what they had to say. And the message I had been so clearly sent was that articles that use grounded theory are not interesting to read. After that time, because reviewers continued to refuse to accept assignments where grounded theory was used, authors were referred to the few specialized grounded theory journals rather than this more general qualitative research one. In the 1990s grounded theory had been a popular and widely used approach, particularly within health and education fields. However, over time, it came to be seen as residing at the conservative end of the qualitative research continuum (Charmaz, 2000; Alvesson, 2002). It is possible that if PhD students use grounded theory in their projects, it may not serve them well, particularly when they seek publication of their work.

Professor Räsänen from Finland, who was quoted earlier in this article, specified exactly what was expected of him at the senior scholar level. So, how do scholars develop from PhD candidate to senior scholar in the modernized university? This article has been considering this question from several different perspectives. Examining the shaping of scholars reminds us that academic work is a complex endeavor taking many years, involving sophisticated intellectual and identity work as well as learning the 'ropes' of the academy. Consideration of how these 'ropes' have shortened and lengthened has been a major interest in this article. While no definitive answers have been arrived at, there are indications that things are different these days to what they would have been when Professor Räsänen and other senior scholars began in the academy. The recent requirement for some PhD students to achieve two published journal articles before the PhD will be awarded is a hurdle that was not previously encountered. Performativity and governmentality may assist understanding of what this requirement means for scholarly identity and the scholarly context.

Conclusion

Individual researchers are shaped and formed in a number of ways including by their university departments, the scholarly traditions and mores of their disciplines, the pressure of time and the ideas they are exposed to. However, it should be remembered that PhD supervisors and the department environment have the major influence on new researchers. This article has pointed to how academics have become increasingly positioned by performativity and new managerialism and how, through governmentality, they may comply and work to improve themselves, even when expectations are unreasonable. This in turn has potential to shape new researchers into compliance and second-guessing what decision-makers in universities and funding bodies—and international examiners—might find acceptable in research, which has potential to breathe new life into the old fashioned and simplistic debates about the merits of qualitative versus quantitative research. Qualitative research has evolved substantially over the past thirty years and has become far too complex for this level of discussion to be taken seriously.

The purposes of this article have been to firstly emphasize the importance of independent, critical, creative and analytical thinking in qualitative research. By employing social theory, greater depth of understanding, explanation and differing perspectives can be offered by researchers who are well placed to contribute substantially to knowledge. The second purpose of the article was to consider how scholarship is constrained and shaped, and how this relates to the identity and future work and success of PhD students. Using theories of performativity and governmentality, this exploration moved beyond, 'What happened?' and 'How do you

know?' to 'What does it mean?'. This third question has particular significance for contemporary qualitative research and knowledge about the social world. And questioning what the university environment means for the future careers of today's PhD students is worth discussing.

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Making Sense of Mixed Method Design in Health Research: Reconciliation of the Findings in a Study of the Doctors' Decision Making Process in Engaging Male Patients in Health Checks

SENG FAH TONG & WAH YUN LOW

ABSTRACT

Mixed method design is often noted as a methodology capitalizing on the advantage of in-depth study in qualitative approaches and the power of generalization in quantitative approaches. However, researchers may face difficulty in reconciling the findings of the two if the results are contradicting from each other. This paper aims to illustrate the findings of grounded theory methods (in phase 1) complementing the quantitative survey (in phase 2) in providing a more complete picture of doctors' decision making process in engaging male patients in health checks. In phase 1, the important determinants in the decision making process were perceived receptivity of male patients, perceived importance of health checks, perceived personal competency in health checks and external barriers. However, in phase 2, the importance of external barriers and perceived competency were deemphasized. The findings make sense if we are aware of the individualistic nature of qualitative approach and normative nature of quantitative approach.

Introduction

Mixed methods research has gained popularity since late 1950s. Essentially, it is an approach where the researcher combines both qualitative methods and quantitative methods in an attempt to understand a social or psychological phenomenon of interest. Many argued that mixed methods research is invaluable because it has the advantage of capitalizing on the in-depth study of qualitative methods and the power of generalization in quantitative methods to understand complex human world. Mixing quantitative methods and qualitative methods allows some forms of triangulation and contributes to the better understanding of human phenomena. Some use mixed methods as a form of exploratory design where qualitative approach is used to explore early concepts in order to pave the design of instruments for the subsequent quantitative approach. Others may use it as an explanatory design where qualitative approach is used to obtain an understanding to the collected quantitative data (Creswell, 2009). Because of such flexibility, and its practical contributions to the solution of problems, mixed methods design is increasingly used by researchers working in applied sciences and professionals such as health care.

Mixed methods design, however, should not be seen as a mere mixing of methods in terms of techniques of data collection and analysis, but should warrant a clear statement of its own assumptions underpinning the design. (Bryman, 1984; Sale, 2002; Biesta, 2010) Clarifying the assumptions is important because the interpretation of the results is anchored at the assumptions. The results are supposed to be inferred to a wider population outside the initial research settings within the set boundaries. The boundaries are obviously demarcated by the

assumptions laid down prior to research. Addressing these assumptions is particularly challenging in mixed methods design because quantitative and qualitative approaches have obvious contradicting assumptions. These assumptions are basically the researchers' worldview of what constitutes truth (the ontology) and what can constitutes knowledge (the epistemology). Most qualitative researchers are comfortable to adopt constructivist position as opposed to quantitative researchers adopting post-positivist position. In a mixed methods study, there should not be two contradicting assumptions, which render interpretation of the results difficult because the interpretations may swing from one anchoring point to the other while making claims. Fortunately, the argument is clearer now, because many mixed methods researchers are happy to adopt pragmatism as opposed to the traditional assumptions of constructivism and post-positivism. The essence of pragmatism is the purpose of the research and its practicality (Tashakkori & Teddlie, 1998; Nastasi & Hitchcock & Brown, 2010; Biesta, 2010), the issues that are not often raised in the discussion of traditional dimensions of epistemology and ontology (Tashakkori & Teddlie, 1998; Biesta, 2010). In pragmatism, knowledge is regarded both as constructed and as a function of a people environment interaction. Knowledge is meaningful if there is a practical consequence to it. (Biesta, 2010; Greene, 2010) Therefore, mixed methods design is a valid methodology if the study purpose is clear and the practicality of generated knowledge is fulfilled. The challenge is to clearly state the purpose of the study and acknowledging the fundamental assumptions (hence the knowledge generated) of qualitative and quantitative approaches – qualitative approach is individualistic where the findings are rich in explaining a phenomenon of interest in *an individual context* while quantitative approach is normative where the findings represent an *average* pattern of a phenomenon of interest in a population. The ignorance of these assumptions leads to wrong interpretation of study findings and impracticality of the knowledge generated. Also, because of this ignorance, researchers often find the reconciliation of the study findings a challenge.

In this paper, we attempt to illustrate, with an example of the study of the doctors' decision making process in engaging male patients in health checks, the importance of having a clear statement of purpose and assumptions underpinning quantitative and qualitative research. The example also illustrates the logic reconciliation of differences in study findings from the two methods.

The background of the study of doctors' decision making process in engaging male patients in health checks

The health status of men is consistently shown to be disadvantaged compared to women's health. (WHO, 2011; Tong & Low & Ng, 2011) Men have a shorter life expectancy at birth and a higher mortality rate in almost all non-sex specific diseases. The main causes of death in men are noncommunicable diseases and injuries. Many of these causes of death are lifestyle related, such as smoking, unhealthy diet, high consumption of alcohol, risk-taking behaviours and violence, and are preventable or amenable to early intervention. (White & Cash, 2004; White & Holmes, 2006; Tong & Ho & Tan, 2011) Furthermore, many male-specific disorders which adversely impact men's quality of life such as erectile dysfunction, premature ejaculation, and androgen deficiency syndrome go under-reported to health care providers. (Trueman et al, 1999; Ng et al, 2007; Shabsign et al, 2010) Silent diseases such as hypertension, hypercholesterolaemia and diabetes are also under-detected. Hence, improving the health status of men should be an important agenda in health care delivery.

Strategies should target both men in the community and improving health care delivery tailored to their needs. (Hall, 2003; Bank, 2008) The ultimate goal is to engage more men in health care. Primary care is identified as the key player. Doctors at the primary care level are

encouraged to be proactive in raising the issue of preventive care and health check-ups for discussions during clinic encounters with men (Hall, 2003). However, despite having guidelines and recommendations to improve our preventive health services for men, we are yet to grasp the appropriate strategies to implement these guidelines to assist primary care doctors. Literature informing effective strategies is lacking. Therefore, we need to explore the current process of care and develop a substantive theoretical framework covering the practice behaviour of doctors in relation to preventive men's health care, before recommending appropriate strategies.

Hence, the purpose of the study was to develop an explanatory model of the process of how primary care doctors (PCDs) make the decision to undertake men's health check-ups in Malaysia. Essentially there are two specific objectives to this. First, it aims to identify the determinants and how they would interact with each other in the process of *individual* doctors deciding whether to initiate a health check-up for men. The second specific objective aims to quantify the *average* impact of each determinant, and rank its a*verage* significance on the decision-making processes among Malaysian PCDs. Identifying the common and important determinants allows a more targeted development of an intervention program aimed at improving the quality of men's health check-ups in primary care settings.

The rationale and approach of mixed methods design

Since nothing has yet been written about such a substantive theoretical framework, we have embarked on an exploratory approach with a sequential mixed methods design. In sequential exploratory mixed methods design, the first phase is a qualitative approach, followed by a quantitative approach in second phase. (Creswell, 2009)

The first phase is to fulfil the first objective –to explore the issue with an approach that does not require a pre-determined set of hypotheses. The qualitative approach, which allows the inductive development of an empirically based theory, (Patton, 2002; Creswell, 2009) is appropriate. In contrast, the quantitative stage requires an *a priori* theory as a starting point. There is no clear empirical data to provide substantive concepts for the development of the hypotheses or theories for the quantitative approach. Therefore, the first part of the objective necessitates a qualitative approach. Its findings will direct the design of a questionnaire and conceptual framework in the second phase of the study, which in turn utilises a quantitative approach to achieve the second objective. Further, it is important to understand all important concepts in determining the practice behaviour of PCDs acting at individual level. This is best explored using qualitative approach.

Grounded theory methods (GTM) were chosen as the methodological process that would achieve the objective of developing a useful theory (Glaser & Strauss 1967) to base an intervention on. GTM provides systematic guidelines on data collection, analysis and producing an inductively derived theoretical framework.(Charmaz, 2006) It has its basis in symbolic interactionism (Charmaz, 2006) which assumes humans act on the meaning they assign to an object (people or things) they interact with.(Benzies & Allen, 2001) Symbolic interactionism arises from the earlier thought of pragmatism.(Crotty, 1998) Given the overarching issue being studied—decision making as a result of a series of actions based on how doctors perceive or assign meanings to the issues at hand—this theoretical underpinning suits the study of social psychological processes (Charmaz, 2006) within the context of PCDs initiating men's health check-ups. The procedures in detail have been published. (Tong et al, 2011) In brief, 52 primary care doctors participated in in-depth interviews (14 doctors) and focus group discussions (8 focus groups). The interviews were recorded and transcribed

verbatim. Line by line coding of the initial three transcripts captured early concepts of the decision making processes. The early concepts directed the subsequent sampling of participants. The concepts were consolidated, modified and adjusted through constant comparative methods, memoing and diagram sketching. Selective coding and theoretical coding were employed towards the end of analysis to construct the substantive theoretical model (figure 2).

The second specific objective demands quantifying the *average* impact of each determinant and discerning its significance on doctors' decisions to undertake health check-ups for their male patients. This is to inform an appropriate strategy that suits most PCDs in Malaysia. The impact is examined from two perspectives: 1) the *average* impact of each determinant on doctors' decision making in undertaking men's health checks, and 2) the *prevalence* of the determinants and hence their relevance to Malaysian PCDs. It is expected that there will be a number of related determinants. The process of quantifying the impact of each determinant is expected to require a multivariate analysis.(Cohen et al, 2003) By quantifying the average impacts, it should be possible to rank the determinants according to their importance in the sample (Keith, 2006) of PCDs, and thereby direct the efforts of improving the service delivery of men's health check-ups.

It is clear that the deterministic nature and need to quantify the relationships of phase II in this project requires a quantitative design.(Bryman, 2008, Creswell, 2009) With an *a priori* theoretical framework developed from Phase I, it permits the use of regression analysis to identify the significant determinants (explanatory variables) on the doctors' intentions and examines the relationship between them. The procedures in detail have been published. (Tong, 2013) In its philosophy, quantitative methodology tries to establish an "average" for the parameters measured, and hence the findings aim to be generalisable (Creswell, 2009) to the Malaysian PCDs. This fits well with the purpose and objective of phase II.

The discussion so far has put forward the utility of developing a practical theoretical framework to guide intervention as the underlying justification of a mixed methods design. Consistent with sequential exploratory mixed method designs,(Creswell, 2009) the initial 'mixing' occurs during the phase II development where findings from phase I will inform both the theoretical framework and scale development in phase II (Figure 1). The subsequent 'mixing' occurs during the interpretation of the findings. The reconciliation of the findings can easily discussed as the findings in phase I operate at individual level and the findings in phase II represents an average pattern which operates at population levels.
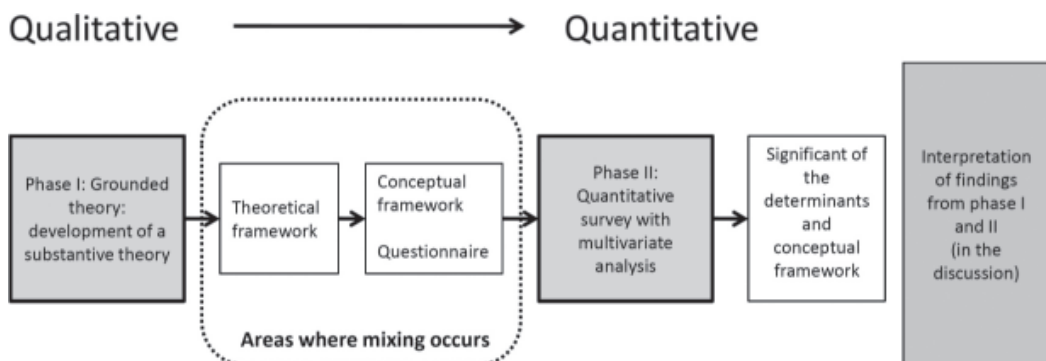

Figure 1. The overall design of sequential exploratory mixed methods

The results of the study: a brief account

Phase 1
From phase I, a theoretical framework was constructed. In engaging male patients in health check-ups, PCDs were required to weigh many considerations before deciding to proceed. The intention to initiate health check-ups started with a mental act of balancing the perceived degree of male patients' receptivity with the importance of a range of potential medical issues facing men (Figure 2).
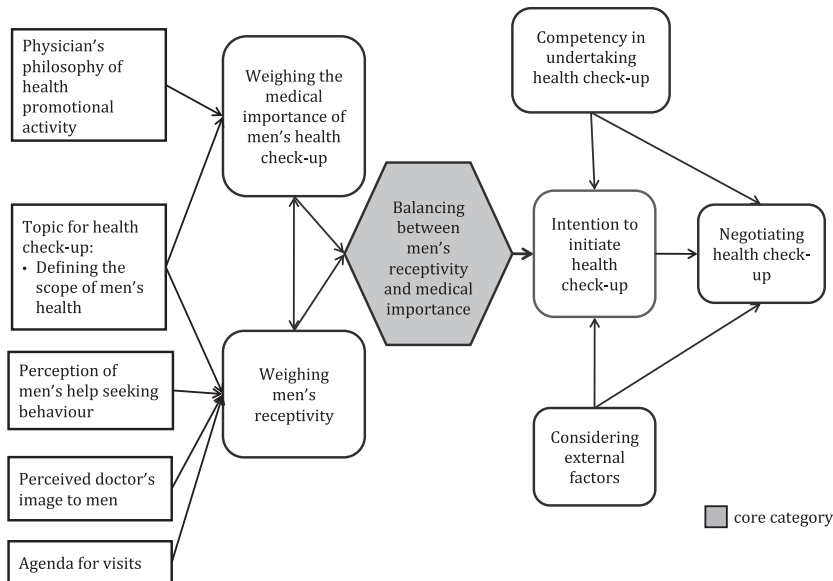

Figure 2. Substantive theoretical model of the doctor's decision making to engage men in health check-ups

The level of receptivity of male patients to health check-ups was determined by doctors based on: their perception of their image in the eyes of male patients, the agenda for visits, their perception of men's help-seeking behaviour, and the topic of men's health at hand. The importance of medical issues, which reflected the attitude of PCDs towards areas of men's health check-ups, was determined by doctors based mainly on two factors: their philosophical stance on health promotional activities and their understanding of men's health issues. The PCDs' understanding of men's health determined the importance they attached to men's health checks and the perception of their patients' receptivity to health check-ups. However, even with a strong intention to initiate health check-ups, the actualization of health check-ups could be modified by perceived external factors and doctors' personal competency in negotiating health check-ups with patients. The external factors included time constraint, network system to support care delivery and cost constraint.

In a nutshell, the determinants were many and complex. Each of the concepts was important in its own way. Some were more important than the other in one PCD's decision making process and others were important for other PCD.

Phase II
In phase II, five areas of men's health were assessed using the framework from phase I. These were cardiovascular health, sexual health, psychosocial health, smoking and colon cancer

screening. Each concept was measured using questionnaires designed from the themes of phase I. The survey was carried out among randomly selected PCDs in Selangor/Kuala Lumpur and Kelantan. 198 PCDs participated representing a response rate of 70.4%. From the regression analyses, the significant determinants were the concept of receptivity and attitudes to health check-up. (Table 1) All the other determinants were deemphasized as shown by smaller â values.

Discussion: Making sense of the results

The results from the two methods demonstrated similarities and differences between each others. Although the concept of receptivity and medical importance (as denoted by attitude) was highlighted in the quantitative regression analysis, the other concepts indentified from GTM did not appear to be significantly associated with doctor's decision to undertake health check-ups. Perception of men's health seeking behaviour, perceived doctor's image, competency in undertaking health check-ups and many external factors were not significant in predicting the intention to initiate health check-ups.

To account for the differences in the findings from the two methods, we have to interpret them from the initial assumptions we have put up. As argued above, the fundamental assumptions are individualistic nature of qualitative study in phase I and normative nature of quantitative study in phase II. From an individual doctor's perspective, any determinant could be the key factors determining his intention to undertake health check-ups. For example, cost-constraints (as an external factor) could the most significant factor for a primary care doctors and perceived medical importance could be the other factors for another doctor. On the other hand, the quantitative methods help in explaining an average pattern seen for the determinants in influencing PCDs' decision making process. Because of the random selection of large group of PCDs and summation of their responses to the questionnaire while performing quantitative analyses, the results represent the normative pattern seen in the sampled participants. Looking from a different perspective, the results never meant to represent any individual doctor's opinion –it is an average of all doctors' opinion. Therefore, although the results from the two methods are different, they are not contradicting because they explain different things. The results are easily reconciled by examining the original purpose of choosing mixed methods i.e. the qualitative methods in exploring the concept at individual level and quantitative methods to measure the average impact of each determinant on the doctors' intention to undertake health check-ups for men. The original purpose fits the assumption of the respective methods as argued above.

The practicality of the results is also easily put forward after taking the consideration of the assumptions and purpose discussed above. In explaining an individual doctor's decision making process, we have to tap on the results of qualitative methods. By using the substantive theoretical model on an individual doctor, we can easily map out the significant determinants for the doctor. Implementing changes to the identified determinants would likely yield changes in his intention to undertake health check-up for men. On the other hand, the average patterns of determinants as in quantitative results help us in focusing on the determinants that have the most important impact for most PCDs. This information would be useful for policy makers and health system designers. They would be interested to focus on a strategy that works for most PCDs rather on individual doctor.

Bringing the assumptions, purpose and practicality together, it is not difficult to make sense of the results, whether or not they are the same. This embraces the philosophy of pragmatism in mixed method design.

Table 1. Summary statistics for usefulness of the models in explaining doctors' intention to initiate health check-ups and their significant determinants

Topic of men's health check-ups	Contexts of consultation	R^2 / Nagelkerke R^2	Significant determinants arranging, from the left to right, in descending order of importance							
				β		β		B		β
Cardiovascular risk screening	Acute minor complaint	0.293	Receptivity‡	0.331	Male patients' HSB†	-0.227	Male patients' expectation	0.193	Referral network	-0.152
	Follow-up	0.276	Receptivity‡	0.267	Male patients' HSB†	-0.237	Attitudes towards HCK‖	0.195	Male patients' comfort	0.168
	Health check-up	0.252	Attitudes§	0.231	Receptivity‡	0.183				
Asking about sexual dysfunction	Acute minor complaint	0.132	Receptivity‡	0.237						
	Follow-up	0.316	Receptivity‡	0.806	Competency¶	0.482	Male patients' HSB†	-0.413	Cost constraint	-0.399
	Health check-up	0.205	Competency¶	0.383	Receptivity‡	0.288				
Psychosocial health assessment	Acute minor complaint	0.219	Receptivity‡	0.312	Attitudes§	0.199				
	Follow-up	0.261	Attitudes§	0.303	Receptivity‡	0.224				
	Health check-up	0.247	Attitudes§	0.346						
Asking about smoking habit	Acute minor complaint	0.245	Receptivity‡	0.651	Male patients' HSB†	-0.217				
	Follow-up	0.258	Receptivity‡	0.389	Referral network	0.353	Attitudes towards HCK‖	0.292	Clinic system	-0.262
	Health check-up	0.339	Receptivity‡	0.720	Referral network	0.456	Attitudes§	0.276		
Discussing colon cancer screening	Acute minor complaint	0.078*	Receptivity‡	0.198						
	Follow-up	0.097*	–	–						
	Health check-up	0.210	Competency¶	0.415	Referral network	-0.214				

* p > 0.05. ‡ Perceptions of male patients' receptivity to the assessment in the corresponding context. § Attitudes towards the medical importance of proactive assessment.
† Perceptions of male patient's help-seeking behaviour in relation to health check-ups. ‖ Attitudes towards medical importance of health check-ups. ¶ Perceived personal competency in the management or assessment.

Conclusion

Mixed methods approach is not simply mixing of quantitative and qualitative methods, but it has its own philosophical underpinnings –pragmatism. Research for the purpose of practicality is the essence of pragmatism. The other related assumption that has to be acknowledged is the individualistic nature of qualitative methods and normative nature of quantitative methods. The mixed methods should not be seen as a way to make-up for the weakness of their counterpart because the two different assumptions are not weaknesses but inherent nature of the methods. Knowing these assumptions, the results are easily reconciled. As health care providers, mixed methods approach potentially offers us the way to explaining a phenomenon of interest both from an individual's perspective and from a population perspective.

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Planning and Implementing Qualitative Interviewing to Extract Students' Analogical Reasoning

MARIA SALIH

ABSTRACT

Research on students' analogical reasoning is not easy to conduct because the cognitive processes occurring in the minds of the students cannot be observed directly. As such, the complexity of this study required adequate foundation before it was carried out. The objective of the research is to explore the analogical reasoning of biology students for the concept of translation in protein synthesis. In order to do so, interviews were conducted to capture the information given by individual student regarding their analogies and how they generated the analogies. This is to obtain an in-depth understanding of the analogical reasoning of the students which could not be determined directly from questionnaires nor the tasks performed. This paper will discuss the planning and implementing of qualitative interviewing throughout the data collecting process to gather the students' thoughts while they had generated the analogies.

Introduction

My first few years teaching Biology at the university level was smooth sailing as the students had a sound and solid basic knowledge at the secondary level. However, stress and anxiety caught me when the university was asked by the Ministry of Education to upscale the knowledge and skills of in-service primary school teachers in order to award them a Bachelor's degree. These teachers have no subject matter specialization whatsoever and have taught for more than 15 years. Teaching molecular biology to this first cohort of in-service teachers was a nightmare as they performed badly at almost every test and examination given. I just feel that there's more to just getting their test scores and reporting their grades every semester. My notion tells me that something is missing, to know and understand 'why they keep on failing?' Was it my teaching or their poor basic knowledge of biology? My substantive interest at this point was 'why' this happens and 'how' am I going to overcome it? I now noticed that numerical data is not sufficient and cannot answer my questions. I have to supplement it with narratives or a case history to capture additional nuances. I begin to believe that qualitative data is more suited to provide me with answers to the questions asked and perhaps to other questions which I'm interested in. In my doctoral thesis, I was interested in how I could use analogies to teach my in-service teachers abstract biology concepts and to gauge their analogical reasoning of the analogies produced.

This paper draws from the research methods and procedures that I employed for my doctoral thesis, "Science Students' Self-Generated Analogical Reasoning of the Concept of Translation in Protein Synthesis". The study attempts to explore the analogical reasoning of biology students from a matriculation college in the vicinity of Kuala Lumpur. It attempts to do so by interviewing the students' analogies of the concept of translation and how they had generated them. I will briefly review the qualitative interviewing technique that I undertake as part of the research methodology employed and putting emphasis on the planning and implementation of the widely used individual face-to-face in-depth interview. This will

include a discussion of the process of conducting in-depth interviews and relevant ethical issues to be considered.

Gentner (1989) defined analogy as the mapping of a system of relations from the 'base' to the 'target' while Earnest & Treagust (2006) defined analogy as a process of identifying similarities between two concepts. Based on these two definitions, I defined analogy as a concrete and visualizable representation via pictures, drawings or descriptive words of the matches and mismatches between the 'source' and 'target' concepts. The 'source' concept is one that the student is familiar with from previous experience. It is a concrete and visualizable concept obtained from the surroundings or from situations in the environment. The 'source' concept also represents the analogy and is used interchangeably. An example of a 'source' concept is the 'camera' as in the 'camera' analogy for the 'human eye' or the 'train' as in the 'train' analogy of translation. A 'source' concept consists of various features that is normally compared and contrasted with the sub-concepts of a 'target' concept. Analogical reasoning on the other hand can be defined as the ability to transfer relational information from the 'source' or 'base' domain to the 'target' (Vosniadou,1989). My study adapts certain aspects of the definition of analogical reasoning by Vosniadou (1989) in that, it refers to the thinking processes occurring in the human mind as one tries to generate analogies of an abstract concept learnt.

Why interview?

Interviewing was one of the techniques used in my study to gather information besides observation. Other than the interview protocol, an analogy task, a test and students' journals were used to collect data. Interviewing or the careful asking of relevant questions can be considered as an important way for a researcher to check the accuracy of – to verify or refute – the impressions he or she has gained through observation (Fraenkel & Wallen, 2006). In interviewing, there is direct verbal interaction between the interviewer and the respondent compared to self-report tests, inventories and questionnaires (McMillan, 2004). According to Fraenkel & Wallen (2006), structured and semi-structured interviews are verbal questionnaires designed to elicit specific answers from the respondents. They are also used to obtain information that can later be compared and contrasted. In the case of my study, I used open ended structured interviews to capture the information given by individual students regarding their analogies and how they generated the analogies. This was to obtain an in-depth understanding of the analogical reasoning of the students which could not be determined directly from the Translation Analogy Task (TAT), observation or the students' journal. For example, open ended questions like:

1. When asked to generate the analogy for translation, what first came to your mind?
2. What makes you think as such?

Answers to these questions could not be observed directly, via their analogies generated neither the journals written. As such it should be coming directly from the respondents' word of mouth and it is via face-to-face interviews that we are able to obtain such information. It is from the information obtained from each individual respondent can the students' analogical reasoning be compared and contrasted among the different achievement groups.

Importance of interview

Interviews are important in any conceptualization study that has something to do with the workings of the mind. This is because students' ideas that could only be expressed in language would be further exposed during the interviews. According to Fraenkel & Wallen (2006), the purpose of interviewing people is to find out what is on their mind – what they think or how they feel about something. This statement was remarked as:

> "We interview people to find out from them those things we cannot directly observe. The issue is not whether observational data is more desirable, valid, or meaningful than self-report data. The fact of the matter is that we cannot observe everything. We cannot observe feelings, thoughts, and intentions. We cannot observe behaviors that took place at some previous point in time. We cannot observe situations that preclude the presence of an observer. We cannot observe how people have organized the world and the meanings they attach to what goes on in the world. We have to ask people questions about those things".

(Patton, 2014, pp. 291)

In whatever situations it may be, the interview is used to gather descriptive data in the respondents' own words so that the researcher can develop insights on how respondents interpret some piece of the world (Bogdan & Biklen, 2003).

The purpose of interviewing was to allow the researcher to gather the students' thoughts while they had generated their analogies. The interviews also helped to support and triangulate the data obtained from the TAT, observation and the students' journal writings. This allows the sharing of a rich description of the analogical reasoning processes so as to provide meaning and perception to better understand and generate hypotheses as designed in qualitative interviewing. The interview questions were structured so that it would not drift from the main objective of probing students' analogical reasoning of the concept of translation. In addition to this, the interview technique is more flexible and can give students the freedom to think and answer without any limitation as the students have the opportunity to question the interviewer if there were questions which they do not understand. This is in view with McMillan's (2004) notion whereby more accurate responses are obtained as the interviewer clarifies questions that the respondent may have and follows up leads (probing). Finally, it is believed that the interview technique is the best technique to attract the students interest to answer honestly and in-depth. Again it is agreeable with McMillan (2004) in that an interview enhances the respondent's motivation and allowed information to be obtained that might not otherwise have been offered, once a good and proper rapport is established between the interviewer and interviewee. Other advantages of using the interview technique includes (i) greater depth and richness of information, (ii) can observe non-verbal responses and behaviors, and (iii) reduces the number of 'no answers' or neutral responses since the interviewer can press for more complete answers when necessary. It has been observed that face-to-face interviewing usually achieve higher return rates as compared to interviewing using questionnaires and often as many as 90 or 95% of the subjects will agree to be interviewed (McMillan, 2004).

Planning and Preparation before Interview

Before proceeding with the data collection process that is conducting the interview proper, the following phases were planned, (i) gaining access to the site and establishing a rapport,

(ii) getting acquainted, (iii) familiarizing students with analogies and practicing generating analogies and (iv) the actual study - conducting the interviews

(i)   Gaining access to the site and establishing a rapport

I made frequent visits to the college to discuss the research with the college academic staff. One of the most important and essential component of qualitative interviewing as described in McMillan (2004) is the process of establishing rapport. As such, it is necessary for me to rapidly develop a positive relationship especially during in-depth interviews. Rapport involves trust and a respect for the interviewee and the information he or she shares. It is also the means of establishing a safe and comfortable environment for sharing the interviewee's personal experiences and attitudes as they actually occurred. It is through the connection of many truths that interview research contributes to our knowledge of the meaning of the human experience.

Rapport with the college principal, science coordinator and academic staff was initiated by conducting several preliminary and pilot studies with them before the actual study. For example the science coordinator, who specializes in biology assisted with the document verification. She was also one of the coders for the reliability check of the categorization of the analogies through the TAT and the students' verbatim interview responses. An earlier batch of science students from the same matriculation college was involved in the pilot tests for the instruments (Translation Test, TAT and interview). The following steps were taken to construct the structured interview questions.

(i)   The original interview questions were first discussed with the group of experts and changes made where required.

(ii)   Then, the questions were pilot tested with a first group of matriculation science students from another college and again revised.

(iii) The revised interview questions were showed to the experts for the second time to be discussed and validated.

(iv)   It was then, pilot tested again twice, firstly, with a second group of matriculation science students from another college and then, with a different student sample from the same matriculation college.

(v)   The final interview questions (after revision and correction) were agreed upon by the experts (a biology coordinator and teacher from the matriculation college and three senior biology lecturers from one of the local university) before being used in the actual study. The initial and final corrected interview questions are shown in Table 1.

The why and how questions in the interviews were used to probe the students so as to capture more information pertaining to the analogical reasoning occurring in the minds of the students. These qualitative data were to provide the 'depth' and 'richness' of the students' self-generated analogical reasoning process for the concept of translation.

(ii) Getting acquainted

Rapport with the administrative staff, academic staff and the students is a prime requirement in qualitative research. I was introduced to the students during their orientation. Following this and prior to the data collection, I conducted various activities with the students such as

Table 1. The initial and final corrected interview questions

Interview questions before correction	Interview questions after correction
1. When I first asked you to generate an analogy of the concept of translation, what first came to your mind?	1. You have generated an analogy of the concept of translation. Can you tell me what was on your mind (your thinking) when I first asked you to generate this analogy?
	2. Why did you think as such?
2. Why did you choose this analogy?	3. Why did you choose this analogy?
3. Explain how you obtain this analogy?	4. Can you explain to me, step by step how you arrive at this analogy?
4. Describe your analogy with the aid of a diagram?	5. Tell me what are the sub-concepts in translation that you match?
5. Explain how you determine the similarities between the 'source' and 'target'?	6. Why do you match them?
	7. How do you match them?
6. Describe what you think and do if you encounter with mismatches between the 'source' and 'target' concepts?	8. As you proceed with the matching, what happens to the other (the rest of the) sub-concepts of translation? Why?
7. How are going to react to the mismatches? Why?	9. How are you going to deal with this?

assisting the teachers to conduct biology revision classes, tutorial classes and tests. All the activities were conducted during their lecture hours, tutorial hours or special allocated sessions for my study.

After being with the students and getting to know them for several sessions, I finally explained the purpose of the research and asked for their cooperation. Since the topic on protein synthesis was taught during the second semester, the students had some time to know and practice generating analogies individually and in groups. I would interact with the students at every meeting which was allocated for me during the first semester. During the 11 weeks of lectures in the first semester, I had four full sessions of two hours each to introduce, practice and discuss analogies. These practice sessions were important and necessary because analogies and analogy generation are still new and at an early stage in the science curriculum of the Matriculation college. As such, it was assumed that majority of the students have little or no idea whatsoever of analogies.

(iii) Familiarizing Students with the Analogies

The subjects were introduced to the meaning of the term analogy and they practise to generate analogies of a different science concept, first in small groups of 4 to 5 people and then individually.

(iv) Actual Study – Conducting the interviews

The actual study was conducted in three sessions. The first session was the observations of the lectures, the second session was the revising session with the students and the third session was administrating the TAT and conducting the interviews. In this paper, I will only focus on conducting the interview.

Immediately after administering the TAT, I conducted a one-to-one interview with the students based on the interview schedule which had been drawn up. I should say that even though an interview schedule has been drawn up, it is still fluid in the sense that it must be flexible to allow for unforseen circumstances that is bound to happen. These are some of the setbacks of interviewing which will be discussed in another section of this paper. Next, the ethical dimension of the interview needs to be borne in mind, ensuring, for example, informed consent, guarantees of confidentiality, beneficence and non- maleficence (i.e. the interview may be to the advantage of the respondent and will not harm him/her). The issue of ethics also need to be taken into account for example, informing the interviewee that the session will be audio and video-taped.

Before the interview proper, I tried to acquaint with the interviewee by talking about mundane issues such as family background, former student life, ambition, hobbies, likes and dislikes and such. According to Bogdan & Biklen (2003), the purpose of this initial chit-chat is to develop accord that is to search for a common ground, a topic that is in common and a place to begin building a relationship. This so call ice-breaking session may take from a split of seconds to a few minutes depending on how well the interviewer knows the interviewee. Once the interviewee felt relaxed and acquainted, I begin the interview by informing the purpose of my study and make assurance that what is said in the interview will be treated confidentially. This assurance is further supported by giving them a consent form. Once the interviewee have read and agreed to sign the consent form, I started the interview guided by the corrected interview questions. The students' analogies were used to assist in the interview whenever required. Empty sheets of paper and pen were also provided for the students to write, scribble and draw whenever they wanted. The interview sessions was video taped and so it gave the researcher the opportunity to observe the interview sessions as well.

Interview Site

The college authorities were nice enough to allocate a special room, a room supposed to be neutral, to carry out the interviews. At times I would change the place of interview for instance, at the science laboratory, in the staff room or in an empty classroom to kill the environmental monotony and the so-call too rigid and confined place. I feel that a bigger, more spacious and less secluded place would be better since it can create a more free, friendly and conducive environment to enable the interviewee to feel free to speak their minds. Irrespective of where the interview was carried out, it was assisted by an audio and video capture. A specific consent form for tape-recording was signed prior to the interview.

Strengths and weaknesses experienced during the interviews

As mentioned earlier, the purpose of the one to one interview was to probe in-depth responses and 'richer' data pertaining to the analogical reasoning of the students and the generation of analogies. Examples of individual interviews are shown below.

> R :   *What was your thinking when asked to generate analogies of translation?*
> L :   *I feel happy.*
> A :   *Feel very happy because given the opportunity to create my own analogy.*
> H :   *Afraid but at the same time challenging.*
>
> (Excerpt)

> R :   *When I ask you to generate an analogy for 'translation', what first came to your mind?*
> L :   *Initially, I imagine the **process** of 'translation' whereby the .... **move** on the 'mRNA' strand.*
> A :   *I see that 'translation' has many stages. So to get an analogy, it must be related to some kind of **stages**.*
> H :   *Sometimes the documentary shows how to mine ore. However, mining ore is interesting, mine the ore and later the ore will be **processed**....like we want to synthesize protein.*
>
> (Excerpts)

The several interview already conducted with the students revealed that they noticed both the matches and mismatches in their analogy. This was implied in their verbatim responses by comparing and contrasting between features of the 'source' and 'target' concepts.

> (Researcher's audit trail)

> R :   *Why did you think of this analogy?*
> L :   *Ah...as for me, I **want** to do something which is difficult that uses my own idea.*
> A :   *I feel that there is more matches, so easier for me **to remember**.*
>
> (Excerpts)

> R :   *Why did you choose this analogy?*
> A :   *As for me, it is **very interesting**, the process of producing newspaper*
> H :   *When I was in Form 3, I **like** the subject Geography so I learn the mining process.*
>
> (Excerpts)

*Students will first draw up a list the sub-concepts of translation and then state the **functions** in another column. Following this is another column of features of the 'source' concept, then they will list the similarities between the two based on the **functions** identified earlier.*

> (Researcher's audit trail)

> R :   *Why did you choose a train as your analogy?*
> L :   *The mRNA is like the passenger, the ribosome...its function is to move from one codon to another, so it can be related to the journey of a train*
> A :   *Because I see the Japanese restaurant, unlike other restaurants, the place where they serve the food is moving...like a train*
>
> (Excerpts)

H :   *To me, the bus seems more suitable because it functions like translation, stop, pick up passengers, move and then stop again, some passengers will go down and some will come up the bus. This is like tRNA carrying the amino acid, it will attach to the ribosome, leave the amino acid, go down.*

(Student's journal)

The data from the interviews help makes transparent the cognitive processes occurring in the minds of the students during analogy generation and strategies taken in response to the mismatches. Good interviews can get a true insight of what's going on in the interviewee's mind and this can produce rich data filled with words that reveal the respondents' perspectives. Also through interview, we can as well know via observation whether a person is telling the truth via their body gestures, facial expressions etc. The audiotapes and videotapes used in the interview may be replaced several times for continued study and analysis. Experts and interested others can also hear and/see what the researcher observed and offer their insights accordingly. A permanent record of certain behaviours can be obtained for comparison with later or different samples.

These are some of the strengths of conducting an interview technique. Oppenheim (2005) suggests that interviews have a higher response rate compared to other means of data collection such as the questionnaire because respondents become more involved and, hence, motivated. Interviews also enable more to be said by the respondents regarding the research than is usually mentioned in a covering letter to a questionnaire. Different types of interviews have different characteristics and thus, have their own strengths and weaknesses as summarized by Patton (2014).

i.   Despite the strengths of interviewing, there are also certain weaknesses that need to be accounted for. For example, there is a possibility of the interviewer being bias and this may influence what they hear or record. Another weakness is the '**halo effect**' which can also occur with interviewers. This occurs when an interviewer allows an initial impression about one aspect of a person to influence the information obtained of another aspect. Some of the problems which I encountered during the interviewing sessions was being impatience. I want quick answers from the interviewee without giving them ample time to think and answer my probes. Occasionally, I get drifted away as I probe the interviewee and by the stories they told. Being too rigid by following closely to the interview questions asked, may not give me any information. I also noticed that I forget the information obtaned if not transcribed immediately. Transcribing interviews is also time consuming, thus I employ a transcriber. Another of my weaknesses is to lead the interviewee to the answer desired (feed the respondents with responses or made them feel uncomfortable with their own thoughts) and to put words into the respondent's mouth. I also find it difficult to ask questions and jot notes at the same time. At times I unintentionally use questions that allow for a 'yes' and 'no' answer and also interrupt the subjects and change the direction of the conversation.

Addressing the problems encountered

I managed to overcome many of the above mentioned problems (except iv, v and viii) as I practice interviewing in my pilot study. This was possible because as there were several stages of pilot study prior to the actual study to validate the research instruments. One tends to get acclimatized to the situation as one repeats the action. Similarly, the first few initial interviews

got me drifted away from the focus of the research. Once I have acquired the technique of probing, I managed to stay in focus. The same goes with being rigid in the interview. After several sessions of interview, I did not have to refer to the interview protocol and the interviews went smoothly gathering more information. I also learned through the mistake of conducting many interviews per week as I could not finish transcribing before the next interview. So I decided to employ a transcriber to assist with work and I learnt to tabulate my interview slots accordingly. I also accumulated the week's transcript before analyzing them and when I analyzed them, I found that there were many similar and repeated flaws and loop holes which were not accounted for. From there plus further reading and consultation with my supervisor led me to realize my mistake of not fully understood the constant comparative method of analysis. The idea of audio and video recording of my interview sessions was thought of when I realized that I was slow in jotting down the interviewee's response and to capture their behavior.

Another way to overcome the above problems as suggested by Creswell (2008) is to draw up a checklist for the general steps in interviewing before conducting the interview. Some of the important points to be considered in the checklist are shown in Table 2.

Table 2. Interview Checklist

1. Identify the participants.
2. Determine the type of interview to conduct.
3. Ensure the setting for the interview is comfortable and quiet.
4. Prepare and test the equipments for interviewing (e.g audiotapes, video tapes, etc).
5. Obtain consent to interview from participants.
6. Listen more and talk less during the interview.
7. Probe to clarify and elaborate answers during the interview.
8. Avoid leading questions (ask open-ended questions).
9. Keep participants focused.
10. Withhold judgments and refrain from debating with participants about their views.
11. Be courteous and thank the participant after the interview.

Trustworthiness of the data

I also kept an audit trail of all the daily activities, discussion with peers and advisors and flow of ideas on a day to day basis. It was somewhat like a personal journal whereby new ideas could be built up as the analysis proceeded with more and more data coming in. For example, at the end of one student's interview session, my audit trail report confirmed the impact of the words 'move' or 'movement' used by the students as shown below.

> *'After interviewing 8 students throughout this week, it was observed that 6 out of 8 of them kept on mentioning about 'movement of the ribosome'. Based on this phrase, they ended up with a 'source' concept that denoted some kind of movement such as a 'train', a 'car' and such'.*

> (Audit trail report)

The audit trail reaffirm that almost all the students from the three different achievement groups would mention the words 'move' or 'movement' from time to time throughout the interview.

As stated by Merriam (2015), it is important for researchers to write their reflections immediately after an interview. This was because the researcher's reflection might take into consideration the insights from the interview description either verbal or nonverbal of the interviewee's behaviour, parenthetical thoughts of the researcher and such (Merriam, 2015).

Similalrly, discussions with experts, co-advisor and peers and their comments in the analysis of qualitative data, helped me to modify and collapse the categories and sub-categories as indicated in my audit trail below.

> *A pattern is starting to emerge slowly. All the three different achievement groups will focus on key words in translation such as a 'process', 'movement' etc. They seem to put emphasize on the biology module by looking at the diagrams. The diagrams in the biology module have a strong influence on them. Adapt directly from the biology module for example the 'train' analogy. The low and average achievement groups based their analogies on their interest, what he/she wants, intend to have.*
>
> <div align="right">(Audit trail report)</div>

The audit trail is among one technique to meet the evaluative criteria posited by Lincoln and Guba (1985) on the trustworthiness of a research study. This involves establishing credibility, transferability, dependability and confirmability which is important to evaluate its worth. In this study, the audit trail and triangulation establishes confirmability, the thick description establishes transferability and member checking establishes credibility.

Conclusion

This article briefly discuss the planning and implementation of a common qualitative interview method which is individual face-to-face in-depth interview widely used in qualitative research to date. Qualitative interviewing seeks to foster learning about individual experiences and perspectives on a given set of issues, in this case, gauging students analogical reasoning of an abstract biology concept. The methods for conducting in-depth interviews and the relevant ethical issues to be considered with particular regard to the rights and protection of the participants was also mentioned.

Based on my personal experience, I should say that before embarking on a particular data collection technique in qualitative research, it is best to plan first to ensure less obstacles being encountered during the process and for best results. Thus it is advisable and appropriate to first identify and define the research problem and research questions. One need to always think through whether qualitative interviews are appropriate to the research problem and questions asked. This is because there are many different forms of qualitative interviewing as well as other types of qualitative research methods that can be used for different problems. For instance, if you are collecting facts or perceptions, would a questionnaire make more sense?

While all interviews are used to get to know the interviewee better, the purpose of knowing varies according to the research question and the disciplinary perspective of the researcher. In this study, I used open ended structured interviews as a technique in qualitative interviewing to capture the information given by individual students regarding their analogies and how they generated the analogies. Another important criteria to consider when planning and conducting qualitative interviewing is to establish rapport so as to gain access of the interviewee and the interview site. This is an essential component of interview as it involves

trust and respect for the interviewee and the information to be shared. It is also the means of establishing a safe and comfortable environment for sharing the interviewee's personal experiences and attitudes as they actually occurred. It is through the connection of many truths that interview research contributes to our knowledge of the meaning of the human experience. In line with this are the ethical issues that are equivalently important to be considered and taken into account seriously. The basic ethical issues is to obtain consent from the interviewee interms of their participation in the interview and the confidentiality of the findings before conducting the interview. One final important aspect to consider in qualitative interviewing is the art of conducting the interview which needs numerous practices to make it perfect. It is usual for a beginner in qualitative research to experience problems initially as I have experiences and mentioned earlier. However, with consistent practice over time, many of the obstacles and weaknesses can be overcome gradually.

It can be concluded that qualitative interviewing takes place when a researcher ask one or more participants general, open-ended questions and record their answers. What I have learned throughout my data collection technique is that qualitative interviewing provided a rich and in-depth information about the experiences of individuals which will contribute to a body of knowledge that is conceptual and theoretical and is based on the meanings that life experiences hold for the interviewees.

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Conception of Thoughtful Teaching by Four Master Teachers in Malaysia

NG SOO BOON

ABSTRACT

The gap between curriculum aspiration and practice is a major concern of all educators. A case study was conducted on four Malaysian master teachers teaching the Revised Secondary Science Curriculum (*RSSC*). These master teachers were involved in the revision of Science Curriculum carried out by the Ministry of Education. RSSC promoted the concept of thoughtful teaching and learning. Being heavily involved with the formulation of RSSC, it would be interesting to study how these master teachers implemented the curriculum. The study was of the qualitative paradigm and exploratory in nature. Long term observations and in-depth interviews were the two main methods of data collection. The outcome of this study revealed that each of the participants displayed his or her (thereafter referred as her) own distinct characteristics, practising her own strategies of teaching. Major principles of thoughtful teaching and learning given by RSSC were adhered to but not the prescriptive models provided by the Department of Education. It appeared that in developing thoughtful teaching, each of these participants directed her attention to different elements of thoughtful teaching guided by her preference and personal characteristics. In order to close the gap between the intended curriculum and the enacted curriculum, there is a need to uncover the relationship between teachers' original ideas and relate it to the new ideas suggested by the intended curriculum.

BACKGROUND OF STUDY

One common problem faced by educators in general and curriculum developers in particular is the mismatch between the intended curriculum and the implemented curriculum. It has always been observed that much of what the curriculum planners aspired is lost through the process of dissemination and subsequent implementation (Hacker, 1984, 1997; Noor Azlan, 1987; Sharifah Nor Puteh, 1994; Wilson, 1999; National Institute for Educational Research Japan 1999). Ultimately, students who are the actual target of the curriculum innovation or curriculum review experience much less of what is intended. The curriculum developers can write well-crafted statements of philosophy of education, aims or objectives of education and intended learning outcomes with the intention of producing future generations possessing certain characteristics and abilities. However, there appears to be some disappointment when the gap between aspiration and reality continues to exist. So, what actually went wrong?

In Malaysia, curriculum change occurs in approximately ten-year cycle. After ten years of implementation of the Integrated Secondary School Curriculum (*Kurikulum Bersepadu Sekolah Menengah*, *KBSM*), a curriculum revision was undertaken resulting in the formulation of Revised Secondary School Curriculum. Sharifah Nor Puteh's observation of KBSM implementation and the teaching and learning milieu in the science and history curricula showed that the KBSM philosophy was largely not adhered to (Sharifah Nor Puteh, 1994). There was a gap between aspiration and practice. Would the Revised Secondary Science Curriculum (hereafter referred to as *RSSC*) face the same fate? As the researcher was directly involved with the formulation of RSSC, it became a question of interest and thus, this study was conducted. RSSC include all the science subjects offered in the Malaysian Secondary

School, which are General Science, Physics, Chemistry, Biology and Additional Science. RSSC was formulated as a consequence of the apparent lack of inculcation of thinking observed in the implementation of the previous science curriculum of KBSM (Jabatan Pendidikan Wilayah Persekutuan, 1996; Md Shah Bachik, 1999; Pusat Perkembangan Kurikulum, 2000d; Jemaah Nazir Sekolah Malaysia, 1999; Sharifah Maimumah & Lewin, 1993). Thus, RSSC was planned to be a thinking curriculum focusing on thoughtful teaching and learning and inquiry discovery. A new curriculum design was formulated. Thoughtful learning is envisioned as involving students actively in thinking and learning to acquire scientific knowledge, master scientific and thinking skills as well as inculcate scientific attitudes. Thoughtful teaching is also one of the strategies of teaching and learning used to affect thoughtful learning. An example of thoughtful teaching is inquiry based teaching and learning (Pusat Perkembangan Kurikulum, 2000a, b, c).

THEORETICAL FRAMEWORK OF STUDY

Macdonald (1965) propounded that there are four systems working in a classroom: curriculum, teaching, instruction and learning. Curriculum is the course of study; instruction is the actual interaction in the classroom; teaching is the "unique patterns of experiences, values, attitudes, etc., of a given teacher" (Macdonald, 1965, p.5) which affects teaching behaviour; learning on the other hand is the "unique experiences, values, attitudes, etc., of each individual learner" (Macdonald, 1965, p.5) which affects learning. Tracing the thought processes of teachers who are facing curriculum change and examining their interactions with the new curriculum documents to produce classroom instruction is a study of the interfaces between these systems of curriculum, teaching, instruction and learning. Through day-to-day instruction, these teachers are the most important instruments for the success of any curriculum innovation (Swartz & Parks, 1994). Although the objectives and activities of any curriculum innovation are targeted at students, in actual fact, teacher always acts as a mediator. How the students experience the new curriculum is mediated by the variety of decisions made by teachers (Remillard, 1999). These decisions are governed by teachers' understanding of the curriculum, and the consideration of other factors. Ben-Peretz (in Remillard, 1999) observed the existence of two levels of curriculum development. The first level is where the curriculum developers pool all the resources, consolidate and conceptualise curriculum design and curriculum plans for the teachers to use. The second level is when the teachers deliberate on the curriculum document, alter, adapt or translate curriculum intention into classroom activities seen by them as appropriate to his or her students (Remillard, 1999). Remillard (1999) used the word 'enacted curriculum' to describe this implemented curriculum. To Remillard, enacted curriculum is more than what is captured in the official documents, textbook or guidebook, it is the events teachers and students experience in the classroom. This enacted curriculum is the actual outcome of any curriculum innovation. To Macdonald (1965), enacted curriculum is in effect 'classroom instruction'. Following his argument, classroom happenings need to be understood and explored in its actual perspective based on the interaction of these four systems. Such exploration would reveal the reasons and contexts causing discrepancy between the intended curriculum and the implemented curriculum. The goal of the curriculum would only be achieved if the four systems converged (Macdonald, 1965). In exploring the implementation of RSSC, this theoretical underpinning of Macdonald was adopted.

METHODOLOGY OF STUDY

A qualitative, multiple case study, exploratory in nature was adopted for this study. Case study methodology was chosen because this study intended to examine a contemporary phenomenon from the perspective of teachers, where an in-depth understanding of what the teachers think and do is necessary. Methods of data collection included individual interview with participants, group interview with participants' students, observations of participants' teaching, questionnaire and participant's thinking journal.

Collection of data ended only when saturation of data was observed, this took about 2 to 6 months for each participant. Within this duration, each participant was observed between five to nine times. Each observation was conducted on a double-period lesson lasting 80 minutes. Each lesson was video-taped and audio-taped by researcher using a handy video-camcorder and two audio-tape recorders. All the tapes were subsequently transcribed verbatim. There were two categories of interviews conducted. The first category of semi-structured interview was carried out in the initial stage of data collection concentrating on participants' understanding of the RSSC, thoughtful learning and other related issues raised through participants' responses. Two semi-structured interviews of approximately 2 hours each were conducted for each of the participants. The second category of interview was unstructured and conducted after each observation of participants' teaching lasting an average of 1 1/2 hours each either immediately after the lesson or later depending on the availability of the participants. Issues brought up during these interviews were related to instructional events or behaviour of teachers or students during the lesson observed. However, often it encroached into participants' beliefs and conceptions of thoughtful teaching that were brought up through interview of the first category. This kind of interview is equivalent to Patton's (1980) 'informal conversational interview' which 'relies entirely on the spontaneous generation of questions in the natural flow of an interaction' (Patton, 1980, p.198) where the persons being talked to may not even realised that they were being interviewed. Group interviews with participants' students were conducted to seek their opinion of the thoughtfulness of participants' teaching as well as their opinion of characteristic of thoughtful teachers. Each group interview lasted approximately an hour and each group consisted of between 4 to 10 students. Questionnaires were given to the participants months before interview and observation to probe participants' initial perception of thoughtful learning and understanding of the curriculum design in the RSSC before they implemented it in school. Participants were also given a thinking journal to record their thinking throughout the period of data collection. Response from this thinking journal was not encouraging. Participants confided to the researcher that they prefer to talk verbally to researcher.

Analysis of data and synthesis of findings were conducted through three stages; these were open coding, axial coding and selective coding (Strauss and Corbin, 1990). Constant comparative method was used as the analytical technique throughout the three stages of data analysis. Validity and reliability of study were ensured through triangulation, long term observation, member's check, peer examination and keeping an audit trail. Three phases of members' check took place with the participants at different stages of the study; transcripts, categories and results of axial and selective coding were shared and discussed. Peer examination was carried out through presentation of findings in seminar, and individual consultation with experts in the field including teachers and lecturers. Audit trail of each step taken such as process of identifying participants, collection of data, derivation of categories, synthesis of data was duly recorded for this study.

According to Merriam (2001), the boundary of the unit in a case study has to be delineated and its occupant identified. In this study, the occupants in the bounded system were four master science teachers teaching upper secondary school Physics, Chemistry or Biology subjects using the Revised Secondary Science Curriculum. These master teachers or participants of this study have between 15 to 30 years of teaching experience. They were involved in the curriculum revision of RSSC, production of training materials for orientation courses conducted every time a new curriculum is to be implemented and subsequently appointed as resource teachers for RSSC. Master teachers (*guru pakar*) are teachers who exhibit exemplary performance in their teaching of specific subject. They are being selected and appointed by the Ministry of Education through stringent procedures of evaluation. Master teachers are given a higher salary scale compared to the rest of the teachers. Choice of master teachers was made since literature has indicated that outstanding or expert teachers are frequently related to teacher who can affect students to think (Newmann, 1990a, b; Onosko, 1992).

RESEARCH QUESTIONS

The purpose of this study was to inquire into selected master science teachers' understanding of the concept of thoughtful learning in the RSSC and to investigate their application of the concept in their teaching practices to create thoughtful classroom.

This study was designed to answer the following research questions:

  i). What are the master science teachers' conceptions of teaching towards creating thoughtful classroom?

  ii). How is the Revised Secondary Science Curriculum being manifested in the classroom?

FINDINGS

The four participants of this case study were Zakiah, Rajendran, Lim and Haryati, all pseudonyms. They were from different states and different schools. Analysis of data has yielded insights into each of their profile, feelings and opinions towards RSSC, conception of teaching towards creating a thoughtful classroom, instructional strategies practised as well as their personal characteristic and planning of lesson. Constant comparative technique was used to affect with-in case and cross-case analysis based on transcripts of interviews and observations... Analysis of data was conducted beginning with 'open coding' where data from interviews and classroom observations were broken down or taken apart into discrete parts to be compared between each other. This was then followed by 'axial coding', where webs of relationship between categories and subcategories were formed (Strauss & Corbin, 1990). Subsequently, 'selective coding' was carried out where core category was sought and the story line determined. Core category is the 'central phenomenon around which all the other categories are integrated' (Strauss & Corbin, 1990, p. 116) whereas story line is the outcome of conceptualisation of the story. The following are the condensed findings of each of these cases.

ZAKIAH

Zakiah is in her late forties, cheerful and always greets people with a warm smile. She has a motherly figure whose concern for everyone, the researcher included, was readily shown throughout the duration of the study. Her facial expression readily reveals how she feels about

things, her joy, her anger, her frustration; it was this kind of no-pretence and sincerity that permeated throughout the study. Zakiah has taught science and biology for 22 years. Her present school, typical of a semi-rural small town school in Malaysia has students coming from diverse background and ability.

Zakiah believes in consolidating concept together with students, in most of her lessons it was observed that she moved close to students, answering to their queries, and exploring together with them. An ambience of learning together prevailed. When asked about 'What is most important in thoughtful learning?'.

Zakiah's immediate answer was 'making the student think, ask probing questions, probe their mind'. Probing to her means 'asking questions, poking them with questions here and there'. The importance of probing their mind was to 'reflect what is in their mind, bringing out all the misconceptions. In all the lessons observed, Zakiah had indeed frequently portrayed this habitual probing of the mind. Of equal importance to probing was providing the chance of 'fiddling' to students. Fiddling was encouraged so that students get to 'see, touch and feel'. Zakiah promoted fiddling that includes letting students trying out their own methods and techniques in the activities that they were doing. When asked later, the students in their group interview told the researcher that they were delighted when given such a chance. As students fiddle, questions would arise in their minds, and this is inquiry to Zakiah – 'looking at and ask, asking all their doubts'. In most part of Zakiah's lessons, the researcher observed that students asked her many questions, whether in group or individually. Zakiah has said that: 'There is no such thing as stupid questions, stupid questions are un-asked questions'. It is thus justifiable to infer that to Zakiah, learning through fiddling and asking questions are essential to create the thoughtful lesson or the learning community she desired. This inference was later confirmed during member's check with Zakiah. With her firm belief in being warm and friendly to students as the background, it was not surprising that one main feature of Zakiah's teaching was her habitual giving of autonomy to students. She let students made decision on many matters such as deciding on procedures in experiment. It was this giving autonomy to students that created the ambience conducive to create the learning community that is central to Zakiah's idea of teaching towards a thoughtful classroom.

Zakiah showed much excitement through her tone of voice and body gesture during the interview when talking about the subject of biology. She sounded passionate about the subject. To her, learning about biology is very important because it allows one to understand his or her life, to understand things around them and all 'the stuff that people are selling around them'. Her enthusiasm was contagious; she spread the enthusiasm to her students. Through her intonation, students followed her arguments or stories attentively and raised various questions. During one of the interviews with the researcher, she expressed her belief that through RSSC, biology has been presented in a more holistic manner and able to equip students with the main gist of biology which would see students through to university.

As a conclusion, in creating a thoughtful classroom, Zakiah's core idea was developing a community of enthusiastic learners of biology. This vision was prompted by her passion of the subject and commitment towards the curriculum she helped to build. This passion and commitment was possible because basically she is a person who is enthusiastic and has high self esteem. The vision of a learning community needs the right ambience and because of her warm personality, it is natural for her to give autonomy to her students, to let them take charge of their learning. Her beliefs of the importance of probing and letting students fiddle and encouraging students to ask questions contribute towards creating this learning
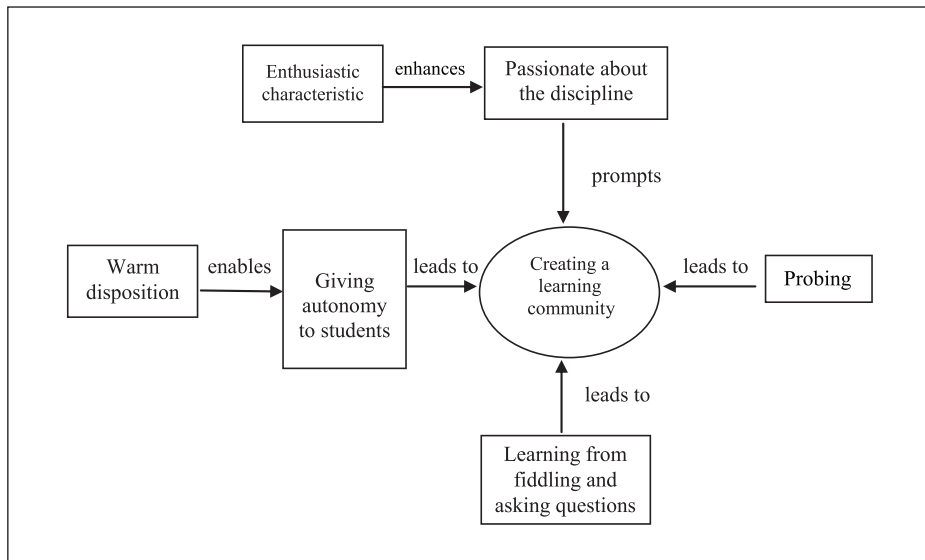
Figure 1: Zakiah's Conception of Thoughtful Teaching

community which to her is the manifestation of 'thoughtful classroom'. This conception is portrayed through figure 1.

RAJENDRAN

Rajendran is a tall, medium built Indian man, who has taught Biology for 29 years entirely in a fully-residential boys' school. Rajendran is philosophical and likes to dwell in depth into issues of life. He spends a lot of time in school with his students. He believes in his ability to affect students and acts as a role model to them. A distinct line of thoughts that emerged through the researcher's interaction with Rajendran during interviews was his persistent reference to teaching not only for the subject matter.

> 'Teaching for about 29 years, I don't only teach this topic, that topic, ... no, no, without realising, other things come inside you. Later in life, they are going to be a doctor, or ......, during that period, incidents can take place where it project them 20 years later in life. In the classroom, I am talking about the subject matter and all these stuffs, these all take up 80%, or even 90%, the 10% I touch on something else, it is only 10%, but 10% is more important for me than the 90% in the class.'

This incidental incidents or consciously crafted incidents which made up the 10% of the lesson that Rajendran meant were about the building of character, the moulding of the personality. In every one of his lessons, there was evidence of this 10% either directly through teaching of biology concepts or making use of little incidents in the classroom. A simple example of an excerpt of lesson indicating this is given here.

> (Teacher moves to table R3, uses a ruler to measure the potato cubes the students have cut)
>
> T: (As he measures the sides of the cubes) good ...good..........

T: Huh! (comes to the 3rd side of the cube, teacher exclaims and uses his hand to gesture 'cut')
(Students murmuring 'can do lah' 'just run a little only' to teacher)

T: (Teacher stands up from the chair, stares and talks to the group R3) can do, is the enemy of excellence, can do is the enemy of excellence, it can't be like that, take one more potato and start again!

T: (Talks to the whole class from table R3) Listen here, must tell the other students, you are suppose to measure 3 cm, 'just run a little', 'can do' no such thing here, can do is enemy to excellence, no such thing, run a little.....

T: Next time, you are going to be doctor, engineers, accountant, you know, account counted wrongly, never mind, 5 cents, it is OK, how can it be? It can't be, must be accurate, so you try to get now, here

Putting together his quest for character building of the students and his reflected thoughts that thoughtful learning did take place in his lesson, the researcher deduced that central to his conception of teaching towards creating thoughtful classroom was this idea of building up of character or personality of the students. How did he propose to inculcate virtues or build up the character of the students? Rajendran talked about learning through mistakes. He gleefully exclaimed that sometimes he purposely let experiments fail because that is when actual learning took place. There were many instances during observations of his lessons where he guided students to learn from mistakes. Besides learning from mistakes, Rajendran also built up students' character through the approach of Needs-Problems-Strategies (NPS) that was being explored and adopted by the RSSC Biology committee in developing the RSSC-Biology curriculum. In the NPS approach, one needs to systematically explores the needs and problems faced by the cells of our body and then critically and creatively contemplate on the strategies used to overcome these problems. Through NPS, students develop the need of accuracy, persistence in finding solution as well as being humble in examining God's creation.

The opportunity to build up the personality of students is not something that is always there. Students cannot be indoctrinated to be good if they are unwilling. There must be something in the teacher that makes the influence works. In this case, Rajendran has such a rapport with students that they could openly tease each other. He moved physically close to students from group to group, patting their shoulders, sitting or standing right besides them, putting his arms around their shoulders, talking to them, observing them, laughing with them, shaking their hands when they have done something right or good and 'pulling their legs'. Rajendran's warm personality has enabled close rapport with students that opened up opportunities for him to help shape his students' character. Besides being warm, Rajendran is also a very expressive person, his students described him as '*kelakar, buat lawak*' [funny, humorous]; his students also think that his presentation of lessons was interesting. His expressiveness and dramatic nature brought the students close to him and this assisted him in getting his teaching, be it biology content or general advice, across successfully.

In summary, the central phenomenon of Rajendran's thoughtful teaching was building up of students' virtue or personality through teaching of biological concept. This was consciously done through letting students learned from mistakes and through the Needs-Problems-Strategies approach. Rajendran's warm and expressive personality trait was a necessary asset for him to create rapport with his students that facilitated the building up of students' virtue through the learning of Biology. Rajendran's conception of thoughtful teaching is portrayed in figure 2.
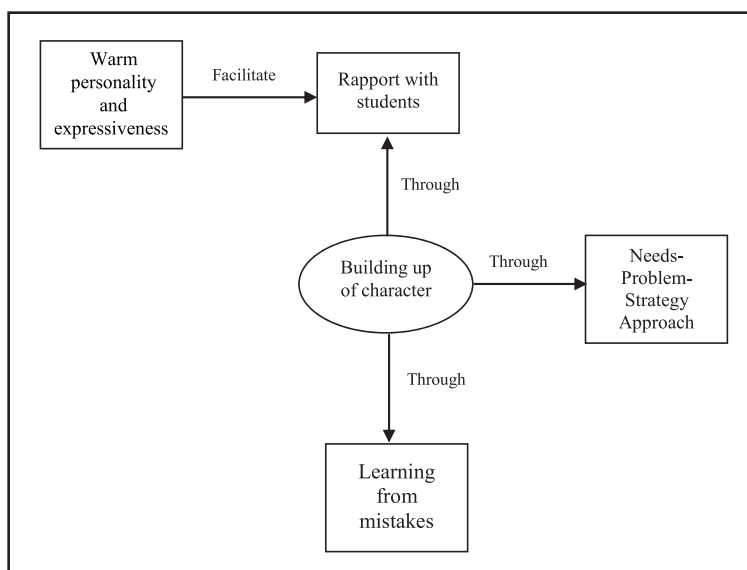
Figure 2: Rajendran's Conception of Thoughtful Teaching

LIM

Lim is a Chinese man in his early fifties. He walks briskly and talks fast. Lim has taught Chemistry for 24 years. His current school was in a town South of Peninsular Malaysia. Students in this school are of diversified family background and are made up of the three main races in Malaysia. Lim is a confident man. He talks with authority and knows his subject matter well. He admits without reservation that he enjoys teaching and being with students, seeing his students 'turn around' and affecting them positively gives him great satisfaction.

Lim's focus is very much on learning. Based on his constant reference during interviews to issues such as evidence of learning, learning output, learning attitudes, time effectiveness, the researcher deduced that to Lim, in teaching towards creating a thoughtful classroom, a teacher needs to concern himself or herself with imparting skills of 'management of learning' among students as shown in figure 3. Lim's scope of 'management of learning' covers the cultivating learning attitudes such as reflecting upon what has been learnt before embarking on something new, making it a habit to document own learning through making summary of what has been learnt.

Another facet of management of learning is time management. Lim told the researcher the he advised students to manage their time well, time for learning must not be sacrificed to carry out other school activities, they need to plan their time well. Besides constantly giving advice, he also showed his allegiance and practice of time management in all the lessons observed. For all activities he gave to students, he would give a time frame, ranging between 5 to 10 minutes. Lim gave time frame to get students started on the activity and to set an estimated range of time for the activity. Time effectiveness according to Lim is not only about students finishing the work, but teacher achieving the task he has in mind and a training ground for students to manage their time.

Besides practising his version of time effectiveness and directly giving advice to students on management of learning, Lim believes that clarity is the most important element in teaching.

He prided himself in being told by many, students and teachers alike, that his teaching or lecture was clear and well structured. Clear and well-structured lessons facilitated students to manage their learning. In other words, to present a well-organized and structured lesson, Lim believes in modelling himself in management of learning to be well-organized and systematic. The following comment is from one of the researcher's note jotted down immediately after one of observation:

> 'Lim knew what to do, there was no hiccup or delay in terms of sequence of instruction, every bit of the lesson was well-packed, no time where students did not know what to do. Every part of the lesson seemed to fall in place nicely.'

One way where Lim made his lesson systematic and structured was through the use of teaching and learning templates, he created these templates to make learning more efficient. An example is the electrolysis template. Besides using templates, to ensure clarity Lim always repeated the same point in many different forms using different approaches. Does it mean that Lim will always repeat concept a fixed number of time? To this, Lim answered:

> 'The number of repetition is not fixed, no. When you begin to notice students are not getting it, for example, you ask questions, they didn't answer, you have to put in another way, you cannot repeat exactly the same thing that you say, it will be boring.'

Another important prerequisite or condition for inculcating the habitual management of one's learning is preparing the path to engage students, setting the ambience ready for internalisation. Lim believed that the way to engage students is by way of questioning. In the lessons observed, Lim asked a lot of questions and he made an effort to direct the questions to as many students as possible.

In coaxing students to take charge of their own learning, motivation is very important. In the lessons observed, Lim only occasionally gave encouraging words to students and acknowledges their efforts. However, students in the class seemed to be highly motivated, they answered questions promptly, they asked teacher questions when they were in a small group or individually, they were very active in class. During students' small group interview, the researcher found them enthusiastic and motivated. When the researcher brought out the issue of motivation during member's check, Lim provided other insights of what he thinks what motivation should be:

> 'Basically my students are motivated not by expression or words, what they see actually are sincerity, I monitor their progress. My students are very close to me, partly because of my interaction with them outside...... and they could actually relate to me very well, they actually come to me and say, well, this is something you have done for me, they relate to me outside the classroom, even borderline students who are written off by other teachers.'

It does seem logical that motivation could be from outside the classroom; something which is not within the researcher's scope to record the data.

By putting management of learning, clarity and structured teaching in the central stage, Lim systematically designed lessons around these concepts. He described his teaching strategy as starting with the 'big picture', followed by 'process' and finally 'reviews'. He placed great emphasis on 'big picture' because he 'wants them to see the whole picture, the preview, the overview'.
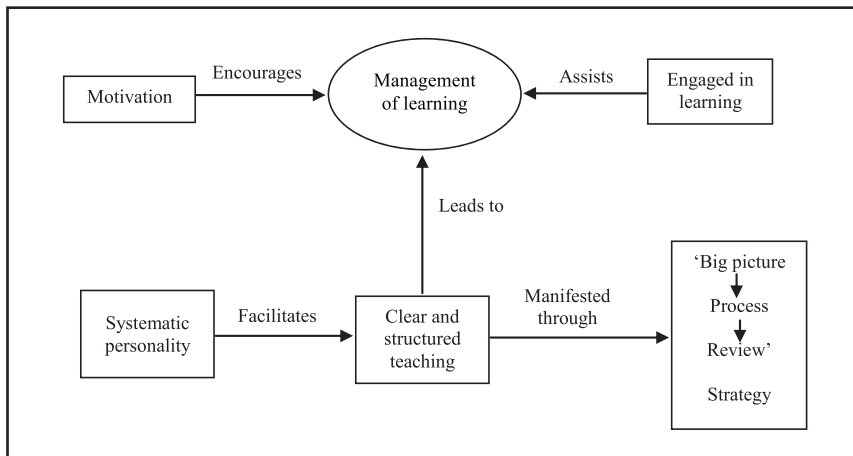
Figure 3: Lim's Conception of Thoughtful Teaching

In summary, Lim's thoughtful teaching centered around management of learning. In preparing students to manage their learning, he ensured clarity and structure in his own teaching through a strategy of 'big picture – process – review'. To assist management of learning he engaged students fully in the learning and he motivated students through his constant care and concern for them. Figure 3 depicts his conception of thoughtful teaching.

HARYATI

Haryati is a Malay lady in her late thirties; medium built and wears a sweet smile. She has taught for 15 years in the same residential boy's school near Kuala Lumpur. Haryati is a warm and easy-going, diligent and she frequently made trips back to school at night to conduct extra classes. Without reservation, she reiterated that her biggest challenge in teaching was to produce good result. Her target was to produce the most number of students who can score 'A' in their examinations.

The central idea in Haryati's conception of teaching towards creating a thoughtful classroom was 'get from students, don't give them' as shown in Figure 4. In all her lessons that researcher has observed, she probed a lot and did not give long lecture. She pointed out that, 'thoughtful learning is the same as inquiry discovery, both let them ask, let them give, let them think'. Another more practical reason for this conception of hers is that, 'if you give, he (student) will fall asleep, (so) let him give'. She regularly elicited relevant everyday examples or applications from students especially prior to learning of the concept. This relating has its purpose in that students could then see that 'what I want them to learn is not something different from what they are doing in everyday life', in other words, making learning more relevant and meaningful.

Consistent with her conception of 'don't give, get from them', Haryati also trained her students to share in the responsibility of conducting self-formative assessment. Haryati also reiterated that hands-on experience is very important. She planned for lots of hands-on activities either through demonstrations by teacher or students carrying them out. She felt strongly that 'without experiment though you can learn Physics, (but) it won't stick to your mind', and this would amount to not understanding the concept being explored. She emphasised that through her experience, to make students understand, they have to experience it. Observation of Haryati's teaching showed that during and after hands-on activites, Haryati would slowly

probed students, eliciting their fully formed or partially formed, accurate or misconceived ideas obtained from the experience to finally reach conceptualization of the physics principle concerned.

Haryati believes in the value of making mistakes. Besides learning from hands-on experience, Haryati talked about learning from mistakes There are different kinds of experiences, one type of experience is making mistakes. She told the researcher that 'Children learn through experience, through the mistakes that they do, it's OK for them to make mistake so that they learn'. When her students made mistake, she continued to practice her concept of 'get from them, don't give'. She facilitated elicitation of ideas and then students were led to the right understanding of the concept.

A teacher who constantly bombards students with questions, eliciting ideas from them need to possess certain characteristic, otherwise students might get bored with him/her. Haryati was expressive especially in her tone; the following researcher's note gives a description of it:

> 'The teacher spoke with different intonation, not flat tone; her voice showed her excitement, approval or disapproval of the students' answers or statements. While she explained questions or made a statement, she stressed on certain words by using her sometimes shrill voice. Her body gesture such as movement of her hand and constant smiles created a friendly ambience, approachable, not the serious school master who shows a stern face. One would not get bored with her lesson or afraid to answer her questions.'

Haryati did not agree with using only one method to teach, she felt that there is no fixed method to carry out thoughtful teaching. According to her, the teaching method that is used by teacher actually would depend on the students in the class.

In summary, Haryati's central idea of thoughtful learning was eliciting ideas from students, she used eliciting ideas to enhance learning from hands-on experience and learning from mistake. To her, thoughtful learning could be achieved through the sequence of teaching of 'observe — infer – conceptualize' that capitalized on eliciting ideas, learning from hands-on experience and learning from mistakes. This is further enhanced through her expressiveness that made the process of elicitation of ideas came alive and successful.
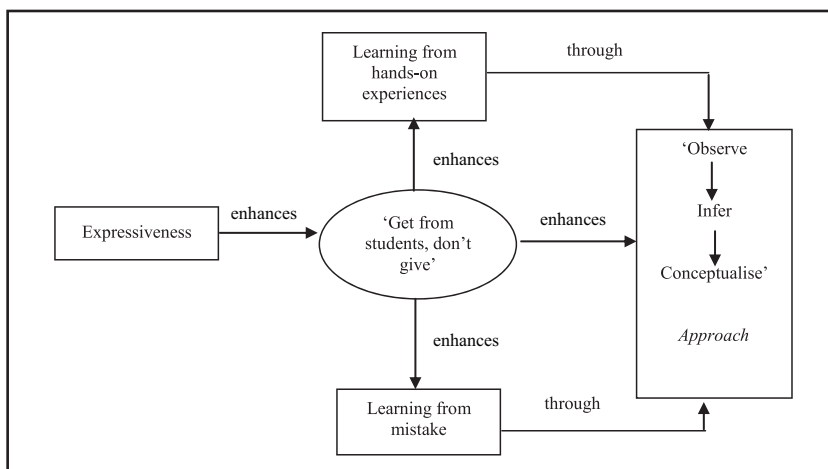

Figure 4: Haryati's Conception of Thoughtful Teaching

DISCUSSION AND CONCLUSION

In answering the research questions of 'What are the master science teachers' conceptions of teaching towards creating thoughtful classroom?' and 'How is the Revised Secondary Science Curriculum being manifested in the classroom?' the researcher found herself confronting four different characters. Participants of this study made up their own mind about what is thoughtful teaching and implemented the curriculum according to these conceptions. Analysis of their respective conceptions and subsequently their instructional strategies suggest that broad principles stated in the curriculum material of RSSC concerning thoughtful learning and inquiry discovery approach was adhered to but not the suggested models or strategies with given and fixed steps and sequence. Participants generally detested following given sequence in their teaching, they preferred to think out their own ways. The broad and general guidelines given in the Curriculum Specification of RSSC provided them with the freedom to manoeuvre. They have in fact expanded their understanding of thoughtful learning to include ideas such as learning community, management of learning and thoughtful in the affective domain. They have added their own dimensions into the concept of thoughtful learning provided in the curriculum document. This concurs with findings of Newman (1990a,b) who had found variance in classroom thoughtfulness that was related to teachers' individual commitments, orientations and skills. In a broader perspective, differences between enacted curriculum and given curriculum, is a norm noticed by many educators (Hacker, 1984, 1997; Noor Azlan, 1987; Sharifah Nor Puteh, 1994; Wilson, 1999; National Institute for Educational Research Japan, 1999; Remillard, 1999).

Could these conceptions be consolidated and synthesized into a continuum of meaningful ideas? By attributing the properties and dimensions of each of these conceptions, it could be deduced that the various ideas brought up through the four different conceptions of thoughtful teaching are in fact the various aspects or elements of thoughtful teaching. The first element of thoughtful teaching obtained from the empirical data of this study is setting up the ambiance. In this case, Zakiah worked on creating a thoughtful community. The second element is considering the characteristic of output, the kind of human to be produced through thoughtful teaching. Rajendran aimed to produce future citizen who are thoughtful in the affective domain. The third element is strategies of learning. Lim focused on management of learning. The fourth element is strategies of teaching. Haryati used inquiry method. It appeared that in developing thoughtful teaching, each of these participants directed her attention to different elements of thoughtful teaching guided by her preference and prominently displayed personal characteristics. Figure 5 portrayed these relationships. Being warm, motherly, passionate about the discipline she was teaching, Zakiah was naturally inclined to prepare the best possible environment and ambiance for thoughtful teaching. Lim was systematic, holistic in his thinking and always having students' welfare at heart, therefore Lim worked on strategies of learning as that is the focus of students' life in school. As a philosophical man, Rajendran believed that teaching students about the finer aspects of life is equally or more important than teaching the subject matter. It is not surprising that Rajendran designed his teaching around building up students' character. Haryati was a practical person, she was diligent, systematic, actively seeking for ideas to improve her teaching and making her teaching interesting, thus it is natural that her emphasis was on strategies of teaching.

Relationships deduced from arguments leading to the formulation of Figure 5 suggested two important factors to be looked into when one dwells into thoughtful teaching. Firstly, in deliberating thoughtful teaching, four elements are worthy of discussion. These are: setting up of the ambiance, identify the target and aim, developing strategies of learning and developing strategies of teaching. Secondly, there seems to be a natural tendency for persons

of certain characteristic and preference to focus on the different elements of thoughtful teaching. These relationships need to be looked at as this study has affirmed that participants internalized and implemented the same curriculum differently affected by their previous experience, personal characteristics as well as ideas about teaching. However, it need to be noted that if further studies of similar nature are conducted on other teachers, other elements of thoughtful teaching might appear or the elements of thoughtful teaching obtained empirically from this study could be further affirmed.

The main conclusion that can be made from this study is that there are variations in the interpretation of the curriculum even among teachers who were involved in curriculum development. Participants of this study created their own conception of thoughtful teaching influenced by their personal characteristic as well as their prior beliefs about teaching and learning.

Figure 5: Elements of Thoughtful Teaching in Relation with Personal Characteristics

IMPLICATION OF FINDINGS

Findings from this study indicate that variation in interpretation of curriculum even among teachers who were heavily involved in curriculum development is inevitable. Since such idiosyncrasies of conception of teaching and instructional strategies will prevail anyway, curriculum should be built upon more comprehensive, bigger idea or principle and more theoretically founded to allow for flexibility in interpretations and not succumb to strict and rigid steps and procedures. Teacher needs to personalise these new curriculum ideas and assistance should be rendered to help them to concretise and conceptualise their ideas. Sessions of brainstorming during orientation courses for the trainers, prior to implementation of the curriculum can be conducted to let teachers bring out their views on what do they think of

the curriculum innovation (where general, basic or underlying principles of the curriculum innovation have been given first); for example, how thoughtful learning can be achieved, much like what the researcher was doing with the participants. Teachers' conceptions of the idea could be built up slowly through probing and discussion. Through this way, curriculum planners could subtly introduce new ideas too. The main idea is to let teachers feel that the conception come from them, it is theirs and their ideas are worthwhile. At the end of the sessions, various conceptions or strategies might emerged; if all of this leads to achieving the same objectives, it should all be accepted and used as samples.

Among the factors affecting the creating of thoughtful classroom is personal characteristic. Particular personal characteristic enhances particular instructional approach. It is because Lim is a systematic person, therefore he teaches the way it is. Rajendran is expressive; another teacher without this personal characteristic would not be able to emulate Rajendran producing the same effect. Zakiah's and Haryati's warmth permitted them to teach in their own styles. This being the case, personal characteristic could be considered a necessary component in any instructional approaches. Changing the teacher's characters is not something easily done. However, teachers can be enlightened on this matter, they need to realise and acknowledge that their personal characteristic plays a part in deciding how to teach and in determining the effectiveness of their teaching. They need to know what are the personal characteristics needed for the particular instructional approach. If they are convinced of the usefulness of a certain educational idea and they have a will to pursue it, perhaps they might slowly be encouraged to change their personal characteristic. Curriculum developers and teacher trainer need to take cognisance of this factor. It would be beneficial for teachers too if this factor of personal characteristic is discussed during professional development courses.

This study on master teachers' implementation of RSSC has managed to produce four distinct cases of teaching. Each has a story to tell. Each story is different. The unique individuality of each case points towards the worthiness of developing cases of teaching. With enough cases developed it could well be a great reservoir of knowledge on practice of teaching. Teacher's trainers, curriculum developers or other relevant parties could definitely benefit from this practice of developing cases. By making these "personal practical knowledge" explicit, teachers are also taking control of their own self-development (Day, 1999).

LIMITATION OF THE STUDY

In this study the limitation can be discussed from two aspects. The first aspect is related to the duration of data collection. The second aspect is concerned with representativeness of participants. Collection of data was conducted during the first year of implementation of the RSSC curriculum. There is always a possibility that participants' conception and strategies of thoughtful teaching might be more matured or stabilised if data was collected later. The second aspect is related to number of participants chosen for this study and their representativeness. Only four master teachers were selected for this study and they did not represent the master teachers or science teachers. The findings of this study cannot be generalised to the general masses of teachers. The findings are pertinent only to the participants in this study; implications of the findings towards the education fraternity can only be made on assumption that the same trend might be observed in the masses of teachers or the same trend or model could be promoted among the other teachers.

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