
MA Geography Education 2015-16

UCL Institute of Education

**Teachers as ‘Boundary Workers’- Teaching for GeoCapabilities using the
iPhone through Geography’s key concepts**

By

Jared Goh Wee Siong

Abstract

Michael Young's (2007, 2011) notion of 'powerful knowledge' is a clarion call for teachers to draw on disciplinary concepts as a basis for curriculum making. Using the iPhone as a curriculum artefact, the paper illustrates the nature of 'boundary work' and its potential to enhance both disciplinary and professional identity. In responding to the pressures of an outcome-based and competence-oriented curriculum in Singapore, geography teachers need to (re)engage with the discipline's key concepts, so as to fulfil the emancipatory potential of the GeoCapabilities approach.

Introduction

The Geographical Association's 2009 'Manifesto' *A Different View* makes a compelling case for teachers to be 'curriculum makers' (Lambert & Morgan, 2010) and speaks of geography as a 'curriculum resource' to be explored and appropriated in the education context. This perspective does not posit the teacher as a mere vessel to deliver or transmit a centrally planned curriculum, but situating one as an active agent who constantly negotiates his or her role in making curricular decisions. Against the backdrop of broader societal changes and education reforms (e.g. The Schools White Paper in the UK, *Thinking Schools Learning Nation* framework in Singapore), the educational landscape in many countries has been reshaped as schools are tasked to equip students with 'progressive skills', via specifying competencies and outcomes in the curriculum (Yates and Young, 2010). This paper situates the discussion in Singapore's context and seeks to address two interrelated enquiries: **What is the role of a geography teacher in the midst of wider policy and curricular changes? How can geography teachers use the discipline as a curriculum resource to 'make' the curriculum?**

This paper first seeks to provide the context of Singapore's education system with its focus of 21st century skills and competencies. To address the two aforementioned enquiries, the paper introduces the notions of 'boundaries' and 'boundary work' (Gieryn, 1983). Specifically, I illustrate how a cognisance of these notions is useful for a geography teacher to make curricular decisions in the midst of wider policy and curricular changes. In the Singapore context, knowledge boundaries should not just be kept, but also crossed to provide a geographical perspective in the production and application of knowledge in various settings. As the geographer teacher engages in 'boundary work' – a recognized form of activity, unique and belonging to the profession as to establish or cross boundaries, both the

disciplinary identity of Geography as a school subject and the professional identity of a geography teacher would be enhanced.

The second section of the paper elaborates on the scope of two key concepts of the discipline - *Space* and *Scale* and their relevance in curriculum making. I contend that the abstract nature of these concepts necessitates a social-constructivist pedagogy to create the alignment between the geographical content, the teaching methods and the experiences of our learners. As Roberts (2014) argue, students make meaning of the subject matter through connecting the theoretical elements of powerful knowledge with their own encounters with the world. In examining the various considerations involved in curriculum making, the paper also discusses the outcomes of a relevant Geography education with reference to the emancipatory potential of the *GeoCapabilities* approach (Lambert *et al*, 2015). A curriculum artefact (Biddulph *et al*, 2015) - the Apple iPhone is subsequently used to elucidate curriculum making process for the Geography theme *Globalisation of Economic Activities*. In the concluding section, I revisit the role of the teacher in leading the geography curriculum as a ‘boundary worker’ and highlight possible future avenues of research in curriculum-making when we teach for *GeoCapabilities*.

Presenting the Singapore context

Since the mid-1990s, Singapore has been at the forefront of reforming the curriculum in response to the perceived challenges of globalisation (Deng *et al*, 2013). Under the overarching framework of *Thinking Schools Learning Nation* unveiled in 1997, there has been a plethora of educational and curricular initiatives introduced to sharpen Singapore’s competitive edge in the globalizing era (Dimmock and Goh, 2011). Amongst these is the *Teach Less Learn More* (TLLM) initiative implemented by the Ministry of Education (MOE)

in 2006, which involved the reduction of curriculum content “to provide [our] students with the time...to help them think more critically and creatively” (MOE, 2010). Schools are encouraged to seek curricular and pedagogical innovations with the likes of problem-based learning and interdisciplinary learning, emphasising the acquisition of skills for lifelong learning and relevant to the future workplace (Ng, 2008). Most recently, the Education Ministry has developed a new vision for the national curriculum, termed Curriculum 2015 (C2015), detailing a set of broad learning outcomes centred on socio-emotional competencies, deemed to be increasingly important in the 21st century (MOE, 2016).

Aside from being a generic macro-curriculum framework that provide guidance to curricular initiatives, TSLN has also percolated into the national curriculum at the subject level. Various academic subjects are required to support students’ development of important competencies necessary for students to thrive in the 21st century. As a core curriculum subject in Singapore, Geography also serves the purpose of nation-building, inculcating the attributes of heightened place awareness and appreciation of Singapore’s role in the global arena. Since the start of the millennium, the Geography curriculum has undergone several changes, most notably its shift from being a full curriculum subject to a diversified range including that of a full curriculum subject, an optional elective or featured as part of an interdisciplinary or multidisciplinary programme (e.g. Integrated Humanities, Active Citizenry Education) in most secondary schools. In fact, the national curriculum (e.g. C2015) is constantly being reviewed and revamped every few years to ensure its alignment to the education ministry’s dominant educational framework, one that is shaped by projecting the desired attributes of its citizens and anticipating the changes in skills set needed for the future. This is not dissimilar to a ‘Future 2’ curriculum scenario described by Young and Muller (2010) where content selections in the curriculum are driven by concerns of immediacy and relevance and with a

heightened need to infuse ‘progressive’ skills such as self-regulation and critical thinking. Such a scenario, according to Frith (2013), possibly leads to the undermining of disciplinary knowledge and the deprofessionalisation of teaching.

To heed Young *et al* (2014)’s appeal to adopt a ‘Future 3’ curriculum, taking us beyond the relativism of current ‘progressive’ skills-led educational thinking, it is an appropriate juncture to consider the aims and outcomes of a geographical education. The GeoCapabilities approach (Lambert and Morgan, 2010) presents an alluring option, as it articulates how geography education can potentially contribute to the development of human capabilities. Influenced by Sen’s (1999) work on the elimination of ‘negative freedoms’ to promote development and human capabilities, Lambert *et al* (2015) identified three specific human capabilities with a geography flavour:

1. Promoting individual autonomy and freedom, and the ability to use one’s imagination and to be able to think and reason;
2. Identifying and exercising one’s choices in how to live based on worthwhile distinctions with regard to citizenship and sustainability;
3. Understanding one’s potential as a creative and productive citizen in the context of the global economy and culture.

The emancipatory potential of these outcomes undoubtedly prompt us, as Geography teachers, to (re)engage with Geography’s disciplinary knowledge, to think about how it can be harnessed as ‘powerful knowledge’, and more specifically how the subject can be taught in a concept-driven manner to promote cognitive reasoning and reflection. The next section introduces the twin notions of ‘boundaries’ and ‘boundary work’, to enable an understanding of the active negotiations involved in curriculum making.

'Boundaries' and 'Boundary Work'

A boundary can be conceived as a distinction that establishes categories of objects, people or activities (Lamont and Molnár, 2002). Within the sociology of education, Bernstein (1990) developed a conceptual framework on classification and frames, stating that there were at least two kinds of knowledge in all societies - the esoteric (or specialized) and the mundane (or everyday). This distinction is important as it illuminates how boundaries can help to distinguish one entity from another – between subject disciplines as well as experts from neophytes and the layperson. Within academic geography, Eden (2005) used the notion to distinguish between 'gold standard' of academic knowledge as independent and authentic, as opposed to 'grey standard' or 'green standard', considered to be tainted by commercial interests. In this context, boundaries are constructed as a response to define the content and institutional borders in order to emphasise the distinctive features of the discipline and profession. It follows that boundaries demarcate the discipline of Geography from other subjects, as well as define the professional identity of a Geography teacher.

Generally, two forms of 'boundary work' (Gieryn, 1983) can be performed by the geography teacher. First and primarily, it involves identifying the distinctive qualities of the discipline to demarcate the boundary between geography and other fields of study. This is broadly based on Bernstein's (1971) 'collection' type of curriculum – one with clear boundaries between subjects so that students become cognisant of the constituents and structure of knowledge within the discipline. Predicated on the key tenets of social realism that privileges the acquisition of knowledge, this form of 'boundary work' requires a strong mastery of specialist disciplinary knowledge. Within geography education, Frith (2011) emphasised the need for the delineation of 'core knowledge' within the discipline, as opposed to 'how-to-knowledge' (Hirsch, 2007). What then is Geography's core knowledge? Rather than a list or

sequence of facts that reduces the role of a geography teacher to simply ‘deliver’ the curriculum (Lambert, 2011), I assert the centrality of key concepts as ‘core knowledge’ of the discipline as they undergird the analytical framework that constitutes Geography as a distinctive area of study. In addition, these disciplinary concepts have the potential to empower the learner to draw synoptic links across a discipline often fraught with division in the ontological roots and epistemological positionings between physical and human geography. Notably, the emphasis on key concepts should not be associated with the ‘scholar-academic’ ideology (Schiro, 2008) or a ‘Future 1’ scenario, where there is a fixed selection of inert ‘core’ knowledge to be passed on to the next generation. In fact, the significance of these key concepts is that they grant students access to ‘powerful knowledge’. The abstract and dynamic nature of these concepts thereby requires the teacher to think deeply about the geography curriculum and the role of pedagogy. In sum, this form of boundary work maintains and augments the discipline’s identity, or in Bernstein’s language, lead to a strong ‘classification’ between subjects.

The second type of boundary work is influenced by the ‘integrated model’ of curriculum where subject boundaries are considered more porous, allowing one to draw connections between these borders. According to Bernstein (2000), boundaries between subject areas and disciplines are state constructed as an ‘official pedagogic discourse’. In fact, different models of curricular integration (e.g. multidisciplinary or transdisciplinary studies) can be traced back to Dewey (1915), who regarded the idea of the division between discrete areas of knowledge as contrived (Carr, 2007). As an inherently interdisciplinary subject (Baerwald, 2010), geography as a field of study has contributed to many cross-departmental collaborations to examine broad-ranging problems that encompass a range of complex processes and phenomena. In Singapore’s context, this is most evident with the introduction

of a new subject Social Studies (Secondary) at the start of the millennium, where ‘traditional’ geographical themes (e.g. the study of ageing population) have been infused in ‘National Education’, to highlight Singapore’s place-specific constraints in order to nurture concerned and rooted citizens in a globalized world. Amidst the fervour for curricular innovations in the form of integrated studies, White (2004) and Standish (2012) have cautioned against ‘global learning’ initiatives which pay lip service to the connections across subjects. Consequently, it is imperative that geography teachers have a strong mastery of subject content in this second form of ‘boundary work’, to harness disciplinary knowledge as a resource to cross boundaries in creating and applying knowledge to new contexts.

Let us take stock. In the above discussion, I have argued for the importance of the discipline’s key concepts in two forms of ‘boundary work’. Lambert (2011), in reviewing the case for Geography and the ‘knowledge turn’ in the English context, asserts that school teachers should be skilful boundary workers. In leading the geography curriculum, evidently, a teacher cannot simply possess subject knowledge, but to be aplomb in using geography’s key concepts as ‘powerful knowledge’ to bridge connections to other fields of study. The role of key concepts would feature prominently in the teaching and learning of the subject, constituting a unique disciplinary identity. In addition, effective boundary work would be recognized by others outside of the community, while an aspiring pre-service teacher would look to acquiring these key competencies of the profession.

Geography’s Key Concepts

Academic geographers have defined the key terms— space, time, place, scale and landscape as Geography’s key concepts which inform the language of the discipline and frame the geographical imagination (Holloway *et al*, 2003). They can be considered ‘key’ as they

underpin the description and categorization of geographical knowledge and understanding, empowering an individual to ‘think geographically’ to respond appropriately to the challenges associated in the 21st century (Lambert, 2009). Brooks (2013) discussed the potential and scope of using key concepts within geography education, building on Taylor’s (2009) suggestion that key concepts to be used to construct the geographical enquiry questions within a topic. This approach has similarly been advocated in the *Understanding by Design (UbD)* curriculum framework by Wiggins and McTighe (1998), which emphasises the use of ‘big ideas’ (i.e. key concepts) and ‘essential questions’ to enable students to access ‘enduring understandings’. The iterative use of these key concepts in the classroom also strengthens the disciplinary identity of geography and unifies different positions to form synoptic links between themes across and within physical and human geography. Notably, a section of this length cannot justify the richness and multiple (and contested!) meanings of these concepts. A short expository of the two chosen concepts - *Space* and *Scale* would nonetheless be required to show their potential and scope in curriculum making with the iPhone.

Geographers have always been interested in *space* in the sense of knowing where places and landscapes are located, why they are there, the patterns and distributions they create, how and why these are changing and the implications for people (Rawling, 2011). Evolving from the 1960s as a spatial science using models to explain patterns of locations (e.g. Burgess concentric model), contemporary research in human geography has examined *space* in more fluid ways. Harvey’s (1989) ‘time-space compression’ and Massey’s (1991) ‘global sense of place’ are seminal works that influence how we think about *space*, its relationship with time and how the concept is inherently *relational*. To think relationally is to uncover the socio-spatial relations behind a phenomenon (Jones, 2009). Massey further developed this notion in

Geographies of Responsibility (2004), where she asserts that *space* presents us with the dimension of things being, bringing into existence others at the same time. In the context of globalisation, *space* is recognised as a product of social relations, connoting a sense of responsibility in a global community that acknowledges unequal power relations between actors.

A geographic *scale* refers to the spatial extent of a phenomenon or study (Marston, 2000). One can only truly appreciate the significance of climate change if one is aware of the spatial and temporal *scale* of the phenomenon. The concept influences the way we represent or make sense of the world, from the personal, local, regional to the global. Being cognisant of the analytical frame allows the learner to make links between geographic scales to develop a more nuanced understanding of a phenomenon. An *interscalar* framing would thus enable one to appreciate how a phenomenon operating at a seemingly global scale (e.g. globalisation) can have impacts on the local and local processes may potentially ‘jump’ *scale* to have far greater impacts on a larger scale (see for example, Herod, 1995).

To make the claim that key concepts of geography constitute powerful disciplinary knowledge is not far-fetched. According to Lambert *et al* (2015), the essential characteristics of ‘powerful disciplinary knowledge’ are that they are abstract, dynamic and part of a system of thought. As key concepts of the discipline, *Space* and *Scale* arguably constitute the discipline’s knowledge base. The significance, according to Bernstein (2000), is that knowledge enables individuals and societies to think the ‘unthinkable’ and the ‘yet-to-be thought’. Bruner (1960) reminded us that fundamental disciplinary principles embedded within the curriculum would help students to acquire deep understandings of subject matter. These principles embrace both the key concepts and methods of enquiry which define the

discipline's 'structure' and central questions. Extending this line of thought, we turn our attention to the process of curriculum making and its various considerations, to illustrate how thinking about subject matter (i.e. the discipline's key concepts) could be privileged as a starting point in curriculum-making, using the iPhone as a curriculum artefact.

Curriculum Making

Curriculum making involves drawing resources from the subject matter, the repertoire of pedagogies deployed by the teacher as well as the lived experiences of the students. As an active agent, the teacher's role is then to 'balance' the three aspects in the curriculum making process (Lambert & Morgan, 2010) (Biddulph *et al*, 2015). Geographical knowledge is co-constructed by both the teacher and learners through the teacher's enactment of curriculum as process (Kelly, 2008). Shulman (1987) also emphasized the central role of teachers when he argued that pedagogical content knowledge (PCK) was an essential component to teach subject matter in accessible, engaging and powerful ways. Specifically, the acquisition of PCK and making the curriculum are important aspects of the 'boundary work' to define the geography's professional identity, demarcating the boundaries between themselves from academic geographers and pre-service teachers.

While the paper has argued for the employment of the key concepts as a subject resource, the abstract and complex nature of key concepts requires the teacher to 'unpack' and make connections with the subject matter. To do so, Roberts (2014) advocates the use of powerful pedagogies (e.g. the enquiry approach by Roberts, 2003, 2013) so that students can gain 'epistemic access' to 'powerful disciplinary knowledge'. The enquiry approach is a social constructivist method and (re)iterative process which involves four stages – sparking curiosity, making sense of data, exercising reasoning and reflective thinking. In the

curriculum making discussion below, the theme *Globalisation of Economic Activities* is framed by an overall enquiry question “Should I purchase an iPhone?” followed by three sub-enquiry questions:

- a) How can the iPhone demonstrate the process of globalisation?
- b) Where does my iPhone come from?
- c) What are the impacts of purchasing an iPhone?

At the nexus of the series of enquiry lies the curriculum artefact – the Apple iPhone, complemented with other lesson resources that enlivens the learning experience. Key concepts of *Space* and *Scale* (and their associated ideas) are integral to the series of enquiry and their significance uncovered through the teacher’s facilitation. The series of enquiry lessons finally culminates in a Socratic seminar where students engage in “dissonance, debate and disagreement” (Brooks, 2010, p.3) to examine the overall enquiry question with an ethical slant, “Should I purchase an iPhone?” The discussion is supplemented by relevant newspaper articles and a *YouTube* video, which contain information on both the positive and negative impacts of iPhone production and the operations of transnational corporations (TNCs). During the Socratic seminar, participants are required to follow through a disciplined questioning process (Paul & Elder, 2006) to explore the implicit assumptions and considerations behind the personal decision concerning their consumption behaviour.

To make the curriculum relevant to the learner, we consider the idea of *Living Geography*, where it “is created when teachers make use of the subject discipline and their knowledge of young people to make sense of the world” (Lambert, 2009, p.7). This guiding educational philosophy urges the geography educator not to neglect “young people’s experiences and encounters with the world” (Brooks, 2009, p.204) because their experience of places and

spaces can be fundamentally different from how adults encounter the world (Valentine, 2000). Griffiths (2010) sums it up well by cautioning that a curriculum which excludes the geographies of young people and devalues their powers of critical thought is likely to be one that is disconnected with our learners. In this case, there are two main reasons for choosing the iPhone as the curriculum artefact. As a multi-functional technological device, it enhances communication and enables access to virtual spaces and communities. More than just using the technological device as a motivation factor (Mitchell, 2009) to engage the current generation of 'digital natives', it is able to enact abstract concepts associated within the economic geography theme (e.g. Globalisation, Development and New International Development of Labour). For example, how can these key concepts allow the students to be aware of their roles and responsibilities in the globalised society we live in? How can *Space* and *Scale* prompt us to think about how we are intrinsically connected as human beings, and that our consumption behaviour locally can have consequences for the (distant) other and the global environment? How do the associated ideas of *relational thinking* and *interscalar framing* empower the learner to make ethically informed decisions with regard to complex issues? Using the iPhone as a curriculum artefact, the next section is an exemplar of a curriculum making process that attempts to attain (aspects of) outcomes outlined by the GeoCapabilities approach.

The Curriculum Artefact in Globalisation of Economic Activities

The curriculum artefact is pivotal to a series of lessons on a topic (Biddulph *et al*, 2015). In terms of Roberts' (2003) enquiry learning cycle, the curriculum artefact provides the 'data' that students interrogate, analyse and make sense of. As mentioned, a curriculum artefact is particularly important in this theme *Globalisation of Economic Activities* due to the abstract nature of the concepts found at the advanced level. The iPhone is a smartphone designed and

marketed by Apple Inc. with an advanced mobile operating system that is capable of running downloaded apps and performs many functions of a computer. Arguably, it can be seen as a physical manifestation of globalisation as well as a product that drives and constitutes the process. The iPhone is intricately woven into young people's geographies and it is often invested with meaning (through social media platforms and apps). Thus, it is an appropriate curriculum artefact to engage a generation who grew up in an increasingly interconnected and networked world with the ubiquity of 'smart' and responsive digital devices. In addition, the choice of the iPhone can bridge the 'digital divide' (Buckingham, 2007) experienced between the teacher and the learners.

Academics have debated much about the definition of globalisation. Jones (2006) provided a comprehensive overview of the plethora of definitions of the term. While hyper-globalists like Ohmae (1990) describes globalisation as the onset of a borderless world - rendering the national borders and the peculiarity of place insignificant, economic geographers like Dickens (1992, p.1) represents it as "a more advanced and complex form of internationalization which implies a degree of functional integration between internationally dispersed economic activities". From these definitions, it can be seen that globalisation is indeed a complex process and phenomenon occurring at various scales, involving many actors implicated in a 'shrinking world'. It is hardly surprising to study globalisation within the school or geography curriculum, given its pervasive nature in influencing every realm of economic and social life in Singapore.

Illustration of the Curriculum Making Process

The geographical enquiry approach (Roberts, 2003, 2013) is primarily used to frame the subject content of the theme. The planning and design of the series of enquiry, focused on the

students' lived experiences and in particular their use/consumption of a familiar product. The table below details the enquiry questions and the articulation of the learning outcomes, followed by an illustration of how the key concepts of *space* and *scale* are enacted to attain various aspects of human capabilities as crystalised by Lambert *et al* (2015).

Unit of Study: Globalisation of Economic Activities (Advanced Level)

Curriculum Artefact: Apple iPhone

Overall Unit Enquiry Question: Should I buy an iPhone?

Sub Enquiry Question	Q1) How can the iPhone demonstrate the process of globalisation?
Learning Outcomes (LO) and Activities	<p>Learning Outcomes: Students should be able to</p> <ol style="list-style-type: none"> 1) describe the various facets and characteristics of globalisation 2) examine the relationship between the mobile device and globalisation (both as a phenomenon and a process) <p>The first enquiry, driven by an understanding of global interconnectedness and interdependence, explores the definition and characteristics of globalisation. Through the use of three learning stations, students will experience the ease and simultaneity of multi-modal interactions through the web browser and social media apps (e.g. Facebook) to explore the economic, social and cultural aspects of the phenomenon. A teacher facilitated discussion will help students uncover how the iPhone is a product that manifests and constitutes the phenomenon but also the driver that facilitates the very process.</p>
How are key concepts of <i>Space and Scale</i> enacted in the learning activities?	Harvey's (1989) 'time-space compression' is an important idea illustrated at the learning stations where students engage with the iPhone. Through the various activities (including communicating via Facebook), students experience the simultaneity of interactions on virtual space and how communications and global-local connections are greatly facilitated by the iPhone.

Sub Enquiry Question	Q2) Where does my iPhone come from?
Learning Outcomes and Activities	<p>Learning Outcomes: Students should be able to</p> <ol style="list-style-type: none"> 1) describe the global production network of linkages surrounding the iPhone 2) explain the spatial distribution of consumption patterns of the iPhone <p>Through investigating the production and consumption patterns (Business Insider, 2012) of the iPhone, students can induce that there is an uneven global distribution of economic activities globally that</p>

	reveals the disparities across the world in terms of development. A closer examination of the global production network of the iPhone reveals the locations of which the phone components are manufactured (e.g. software of the iPhone is from the US, rare earth from Mongolia, microchips from Japan, assembly plants in China)(Finance Online, undated).
How are key concepts of <i>Space and Scale</i> enacted in the learning activities?	This inquiry focuses on the spatial distribution of both the production network and consumption patterns of the iPhone to reveal the unevenness of these economic activities across <i>space</i> . An examination of the global production network of the iPhone reveals the spatial shift of manufacturing from advanced capitalist societies or Developed Countries (DCs) to Less Developed countries (LDCs) – known as the New International Division of Labour (NIDL), as well as the spatial organization of Apple’s operations in a hierarchical fashion of headquarters, research and development centres and outsourcing firms. The consumption patterns of the iPhone in the world or region are proxy indicators of relative wealth and inequality across <i>spaces</i> at different <i>scales</i> .

Sub Enquiry Question	Q3) What are the impacts of purchasing an iPhone?
Learning Outcomes and Activities	<p>Learning Outcomes: Students should be able to</p> <ol style="list-style-type: none"> 1) evaluate the impacts of Apple’s production of the iPhone in host countries 2) engage in ethical reasoning and reflect on their personal consumption habits <p>Prior to the Socratic seminar, students are given a few sources highlighting the positive and negative impacts of the iPhone in host countries including for example:</p> <ol style="list-style-type: none"> a) A <i>YouTube</i> video on working conditions on iPhone: Inside Chinese Factories- The truth about working conditions at Foxconn, Apple and HP factories. (https://www.youtube.com/watch?v=KqEjaBYXRbA) b) Statistics on foreign direct investments and employment in host countries of iPhone production. For example, according to Xing and Detert (2010), US\$179 is credited to China’s gross exports whenever a 3G iPhone is shipped abroad. c) Newspaper articles related to the environmental impacts of manufacturing of the iPhone <p>Students will pose questions amongst themselves and engage in a Socratic dialogue to uncover the assumptions. Students are required to respond to the overall enquiry “Should I purchase an iPhone?” be able make careful and ethical considerations and justify their decision.</p>
How are key concepts of	Reading the sources of the impacts on iPhone invokes <i>relational thinking</i> and <i>inter-scalar framing</i> on the part of the students as it dawns

<p><i>Space and Scale enacted in the learning activities?</i></p>	<p>on them that their consumption of the iPhone may have impacts of (distant) others. The ethical decision-making process sensitises students to the interconnections that exists between various scales, helping them to understand their decisions are intertwined with the lives of factory workers manufacturing the iPhone in bad working conditions. The Socratic seminar uncovers the assumptions, values and ethics underlying the decision making process and the geographies of responsibility involved.</p>
--	--

An important caveat from the above illustration is that the use of the curriculum artefact may not address all the learner outcomes within the theme. Evidently, the curriculum artefact is often complemented with other appropriate resources selected by the teacher to provide a narrative to engage the learner and sustain his/her interest throughout the curriculum unit. There is also an implicit assumption that most students will have access and are familiar with the functionalities of the iPhone. While the smart phone penetration rate is generally high in Singapore, the geography teacher should be also mindful and sensitive to their diverse backgrounds, needs or learning preferences.

Perhaps most importantly, the above illustrates how the enactment of the key concepts *space* and *scale* in the enquiry process can potentially fulfil the emancipatory aspects of the GeoCapabilities approach. However, it is noteworthy to mention that the learner outcomes outlined are adapted from the Singapore-Cambridge GCE ‘Advanced’ Level Syllabus, which do not contain either synoptic links across the discipline or other interdisciplinary outcomes. However, within the constraints of preparing students for a high-stake examination in limited curriculum time, the geography teacher can still consciously explore and draw synoptic links to discuss in class related issues such as urban surveillance due to the Global Positioning System (GPS) installed in the iPhone. Regarding multi-disciplinary projects (e.g. the discipline of Economics concerned with the production cost and factors influencing the demand and supply of the iPhone), the form of ‘boundary work’ would involve the teacher

being certain of what geographical key concepts can bring to the table for the production and application of knowledge in new contexts in a cross-departmental collaboration.

Conclusion

Using the notions of ‘boundaries’ and ‘boundary work’, the paper has illuminated the active negotiations a teacher has to make in leading the geography curriculum. I have argued that the key concepts of geography *space* and *scale* can provide in-routes for students to access Young’s notion of ‘powerful knowledge’. As such, disciplinary key concepts should be harnessed in the curriculum making process. The abstract nature of these concepts would thus necessitate the use of ‘powerful pedagogy’ (in this case, the enquiry approach) to unpack the meanings and associated ideas using the curriculum artefact. While the scope of the paper did not allow the full potential of the disciplinary key concepts to be exemplified, the discussion raises several important implications for geography teacher training and professional development. A strong conception of specialist disciplinary knowledge within education settings is a pre-requisite to engage in effective ‘boundary work’ – involving the demarcation and crossing of borders that strengthen the boundaries in enhancing both disciplinary and professional identities. This paper has also examined the role of the teacher in leading the geography curriculum, making decisions about ‘what to teach’, ‘how to teach’ and ‘to what ends’ (Castree, 2005). Further research and conversations would be required to add empirical flesh (i.e. for other geographical themes) to explore the multiple trajectories where the disciplinary concepts can facilitate the means to nurture the desired dispositions embodied in the geo-capabilities approach.

(5261 words)

References

- Baerwald, T. (2010). Prospects for Geography as an Interdisciplinary Discipline. *Annals of the Association of American Geographers*, 100(3), pp. 493-501.
- Barnett, C., Cloke, P., Clarke, N. and Malpass, A. (2010). *Globalizing responsibility: The political rationalities of ethical consumption*. London: Blackwell.
- Bernstein, B. (1971). On the classification and framing of educational knowledge. In MFD Young (ed). *Knowledge and Control: New directions for the sociology of education*. London: Collier MacMillan, pp. 47-69.
- Bernstein, B. (2000). *Pedagogy, symbolic control and identity: Theory, research, critique* (2nd ed.). Lanham, MA: Rowman & Littlefield.
- Biddulph, M., Lambert, D. and Balderstone, D. (2015). *Learning to teach Geography in the secondary school: A companion to school experience*. 3rd ed. London: Routledge.
- Brooks, C. (2009), Teaching Living Geography – making a geography curriculum, in D. Mitchell (ed.), *Living Geography: Exciting futures for teachers and students*. Chris Kington Publishing: London.

Brooks, C. (2010), Introduction, in Clare. B. (ed.) *Studying PGCE Geography at M Level*, Routledge: Oxon.

Brooks, C. (2013). How do we understand conceptual development in school geography? in D Lambert & M Jones (eds.), *Debates in geography education*. Routledge, pp. 75-88.

Bruner, J. S. (1960). *The Process of education*. Cambridge, Mass.: Harvard University Press.

Buckingham, D. (2007) *Beyond Technology: Children's Learning in the Age of Digital Culture*. Polity.

Business Insider (2013). *How many iPhones Apple will sell around the world?* [online] Available from <http://www.businessinsider.com/iphone-5-sales-by-area-around-the-world-2012-9?IR=T> [Accessed 28 Dec 2015].

Castree, N. (2005). *Nature*. London: Routledge.

Carr, D. (2007). Towards an Educationally Meaningful Curriculum: Epistemic Holism and Knowledge Integration Revisited. *British Journal of Educational Studies* 55(1), pp. 3–20.

Deng, Z., Gopinathan, S. and Lee, C.K.E (2013). *Globalisation and the Singapore curriculum: From policy to classroom*. Springer: Singapore.

Dewey, J. (1915) *Schools of To-morrow*. University Press of the Pacific.

Dickens, P. (1992). *Global shift: The internationalisation of economic activity*. London: Paul Chapman.

Dimmock, C. and Goh, J.W.P. (2011). Transforming Singapore schools – the economic imperative, government policy and school principalship. In: Townsend, T. and McBeath, J. (eds.) *International Handbook on Leadership for Learning*. Series: Springer international handbooks of education, 25. Springer: Dordrecht, The Netherlands.

Eden, S. (2005). Green, gold and grey geography: Legitimizing academic and policy expertise. *Transactions of the Institute of British Geographers*, 30(3), pp. 282-286.

Finance Online (Undated) How iPhone is made: the global assembly line [online] Available from <http://financesonline.com/hello-world-the-economics-of-iphone/> [Accessed 28 Dec 2015].

Frith, R. (2011). Making geography visible as an object of study in the secondary school curriculum. *Curriculum Journal*, 22(3), pp. 289-316.

Firth, R. (2013) What constitutes knowledge in geography? in D. Lambert and M. Jones (eds) *Debates in Geography Education*, Abingdon: Routledge, pp. 59-74.

Gieryn, T. F. (1983). Boundary-work and the demarcation of science from non-science: strains and interests in professional ideologies of scientists. *American Sociological Review* 48(6), pp. 781–795.

Griffiths, H. (2010). Young people's geographies. *Teaching Geography*, 35(2), Geographical Association.

Harvey, D. (1989). *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*. Cambridge, MA: Blackwell.

Herod, A. (1995). International labor solidarity and the geography of the global economy. *Economic Geography*.71, pp. 341–363.

Hirsche, E. D. (2007). *The knowledge deficit*. Boston, MA: Houghton Mifflin.

Holloway, S., Rice, S. and Valentine, G. (2003) (Eds.) *Key concepts in geography*, London: Sage.

Jones, A. (2006) *Dictionary of Globalization*. Cambridge: Polity Press.

Jones, M. (2009). Phase space: geography, relational thinking and beyond. *Progress in Human Geography*, 33(4), pp. 487-506.

Kelly, V. (2008). *The Curriculum: Theory and Practice*. 6th ed. London: Sage.

Lambert, D. (2009). What is Living Geography?, in D. Mitchell (ed.), *Living Geography: Exciting futures for teachers and students*, Chris Kington Publishing: London.

Lambert, D. (2011). Reviewing the case for geography, and the 'knowledge turn' in the English National Curriculum. *The Curriculum Journal*, 22(2), pp. 243-264

Lambert, D. & Jones, M. (2013). *Debates in Geography Education*. Oxon: Routledge.

Lambert, D. & Morgan, J. (2010). *Teaching Geography 11-18 – A conceptual approach*. Maidenhead: Open University Press.

Lambert, D. & Young, M. (2014). *Knowledge and the Future School - Curriculum and Social Justice*. London: Bloomsbury.

Lambert, D., Solem, M. and Tani, S. (2015). Achieving human potential through geography education: A capabilities approach to curriculum making in schools. *Annals of the Association of American Geographers*, 105(4), pp. 723-735.

Lamont, M. and Molnar, V. (2002). The Study of Boundaries in the Social Sciences. *Annual Review of Sociology* 28(3): pp. 167–195.

Marsden, W.E. (1989). All in a good cause: geography, history and the politicisation of the curriculum in nineteenth and twentieth century England. *Journal of Curriculum Studies*, 21(6): pp. 509-526.

Marston, S.A. (2011). The social construction of scale, *Progress in Human Geography*, 24(2), pp. 219-242.

Massey, D. (1991). A global sense of place. *Marxism Today*, 38: pp.24-29.

Massey, D. (2004). Geographies of responsibility. *Geografiska Annaler*, 86(1): pp.5-18.

Mitchell, D. (2009). *Living Geography: Exciting futures for teachers and students*, Chris Kington Publishing: London.

Ministry of Education, Singapore (2010). *Parliamentary replies*. [online] Available at: <http://www.moe.gov.sg/media/parliamentary-replies/2010/04/teach-less-learn-more.php>
[Accessed 5 Jan 2016]

Ministry of Education, Singapore (2016). *21st century competencies*. [online] Available at: <http://www.moe.gov.sg/education/21cc/> [Accessed: 5 Jan 2016]

Morrow, W. (2009). *Bounds of Democracy: Epistemological Access in Higher Education*. HRSC Press, Pretoria: South Africa.

Ng, P.T. (2008). Teach Less, Learn More: Seeking Curricular and Pedagogical Innovation, in Jason T. & Pak Tee N. (eds.) *Thinking Schools, Learning Nation: Contemporary Issues and Challenges*. Prentice Hall: Singapore.

Ohmae, K. (1990). *The Borderless World*. New York: Harper Business.

Paul, R.P. & Elder, L. (2006). *The Thinker's Guide to The Art of Socratic Questioning*, Foundation for Critical Thinking: CA.

Popke, J, (2006). Geography and ethics: everyday mediations through care and consumption. *Progress in Human Geography*, 30(4), pp. 504-512.

Rawling, E. (2001). *Changing the subject: The impact of national policy on school geography 1980-2000*. Sheffield: Geographical Association.

Rawling, E. (2008). *Planning your Key Stage 3 Geography Curriculum*. Sheffield: The Geographical Association

Rice, R.E. (1992). Towards a broader conception of scholarship: The American context in Whiston, T. and Geiger, R. (eds) *Research and Higher Education: The United Kingdom and the United States*. Buckingham: SRHE/Open University.

Roberts, M. (2003). *Geography through enquiry: Making sense of the Key Stage 3 classroom*. Geographical Association.

Roberts, M. (2013). *Geography through enquiry: Approaches to teaching and learning in the secondary school*. Geographical Association.

Roberts, M. (2014). Powerful knowledge and geographical education. *The Curriculum Journal*, 25(2): pp. 187-209.

Schiro, M. (2008). *Curriculum theory: conflicting visions and enduring concerns*. London: Sage.

- Sen, A. (1999). *Development as freedom*. New Delhi. Oxford University Press.
- Shulman, L.S. (1987). Knowledge and teaching: Foundations of the New Reform. *Harvard Education Review*, (57), pp.1-22.
- Standish, A. (2009). *Global perspectives in the Geography curriculum*. London: Routledge.
- Taylor, L. (2009). GTIP Think Piece- Concepts in Geography. [online] Geography Association. Available at: <http://www.geography.org.uk/gtip/thinkpieces/concepts/> [Accessed 9 Nov. 2015].
- Valentine, G. (2000), “Exploring Children and Young People’s Narratives of Identity”, *Geoforum*, 31(2): pp. 257-67.
- White, J. (2004). *Rethinking the School Curriculum: values, aims and purposes*. London: Routledge Falmer.
- Wiggins, G. P. & McTighe, J. (2005), *Understanding by Design*, ASCD: USA.
- Xing, Y. and Detert, N. (2010). How the iPhone widens the US Trade Deficit with PRC, *ADB Working Paper*, 257.
- Yates, L. and Young, M. (2010). Globalisation, knowledge and the curriculum. *European Journal of Education*. 45(1), pp. 4-10.

Young, M. (2007). *Bringing knowledge back in: From social constructivism to social realism in the sociology of education*. London: Routledge.

Young, M. (2011). The Return to Subjects: A sociological perspective on the UK Coalition Government's approach to the 14-19 curriculum. *Curriculum Journal*, 22(2): pp. 265-278.

Young, M. and Muller, J. (2010). Three educational scenarios for the future: Lessons from the sociology of knowledge. *European Journal of Education*. 45(1), pp.11-27.

Young, M., Lambert, D., Roberts, C. and Roberts, M. (2014). *Knowledge and the future school: Curriculum and social justice*. Bloomsbury: London.