

Art. #1901, 10 pages, <https://doi.org/10.15700/saje.v41n2a1901>

Deep learning opportunities in the geography classroom

Devika Naidoo 

Department of Education and Curriculum, Faculty of Education, University of Johannesburg, Johannesburg, South Africa
devikan@uj.ac.za

From a cognitivist theory stance, domain-specific subject knowledge is necessary for deep learning and cognitive advance. What opportunities for deep learning and cognitive advance are provided in geography classrooms? This analysis of teaching in geography classrooms is framed by the concepts of deep learning, pedagogic discourse, and a curriculum of engagement. This article draws on Grade 10 and 11 lessons observed, recorded, transcribed, analysed and qualitatively interpreted. Analysis of pedagogic discourse shows diminished opportunities for deep learning and cognitive advance. Geography is being taught in less elaborated ways and more for compliance, thereby hindering deep learning of the epistemic structure of geography. Furthermore, surface features of the curriculum including knowledge as “given” have displaced attention to underlying principles and conceptual meanings. These practices deny learners access to deep learning of powerful knowledge. Implications for social equality and teacher education are raised.

Keywords: deep learning; epistemic structure; geography; pedagogic discourse

Introduction

From a cognitivist theory stance, domain-specific subject knowledge is necessary for deep learning and cognitive advance. The existing literature suggests that “deep learning rather than surface learning of information, facts, and formulas should be the aim of education” (McPhail, 2020:2). Deep, rather than surface learning, is accepted as one of the main goals of 21st century education. It is defined as an “umbrella term for the skills, dispositions, and knowledge that students must possess to succeed in 21st century jobs and civic life. At its heart is a set of competencies that students must master to develop a keen understanding of academic content and apply their knowledge to problems in the classroom and on the job” (William + Flora Hewlett Foundation, 2013:para. 1).

While the 21st century skills field and the cognitive science literature concur that deep learning should be the aim of education, they differ on the curriculum through which it could be achieved. The 21st century skills approach suggests that through real-world problems and interdisciplinary knowledge deep learning will occur (McPhail, 2020). The cognitive science literature holds that deep learning occurs when domain-specific subject knowledge is taught.

From cognitive science literature, deep learning refers to cognitive advance derived from domain-specific content knowledge. Deep learning relies on the accumulation and retention of factual knowledge, which is subsequently utilised in interaction with domain-specific concepts to develop understanding; to move from content to conceptual, abstract and generalisable thinking; and from surface to deep learning (McPhail, 2020). According to Hattie and Donoghue (2016), deep learning occurs via active higher-order thinking, such as looking for patterns and underlying principles, examining arguments critically and becoming actively interested in subject content during the learning process.

Deep learning refers to “[s]eeking meaning, relating and extending ideas, looking for patterns and underlying principles, checking evidence and relating it to conclusions, examining arguments cautiously and critically and becoming actively interested in the course content” (Hattie & Donoghue, 2016:3).

Deep learning is more likely if curriculum designers and teachers are aware of the epistemic structure of the domain of knowledge, beginning with the identification of the concepts to be taught and their inter-relationships (McPhail, 2020). Deep engagement with the disciplinary structure and concepts is justified by three key reasons: beginning with the epistemic structure provides access to the underlying, generative concepts of the discipline – its system of meaning; it should enable a deep level of coherence between concepts, content, pedagogy, and assessment; and it enables the interrelationship between context-dependent knowledge and generalising to be more clearly charted (McPhail, 2020). Concepts are context-independent and, therefore, allow generalisation to occur. Generalisation emerges from thinking conceptually and abstractly in the process of nominalisation – turning verbs into nouns so they become concepts rather than actions (McPhail, 2020).

The foundation of deeper learning is mastery of core academic content, whether in traditional subjects such as mathematics or in interdisciplinary fields which merge several key fields of study (William + Flora Hewlett Foundation, 2013). According to the William + Flora Hewlett Foundation, mastering core academic content means that learners need to develop and draw from a baseline understanding of knowledge in an academic discipline and are able to transfer knowledge to other situations. They understand key principles and relationships within a content area and organise information in a conceptual framework. They learn, remember, and recall facts relevant to a content area and they are able to apply knowledge and theories to real-world situations (William + Flora Hewlett Foundation, 2013).

In this study I scrutinise opportunities for deep learning and cognitive advance in Grade 10 and 11 geography classrooms.

Context and Background

The first post-apartheid curriculum, Curriculum 2005 (C2005), was implemented in 1998. It had three key design features: integrated knowledge, outcomes-based education (OBE) and learner-centred education (Harley & Wedekind, 2004). It was a radical learner-centred, constructivist project set in an outcomes-based curriculum form (Hoadley, 2018). It did not specify what knowledge should be taught – teachers were expected to select content for teaching based on what was relevant in their local contexts. C2005 foregrounded outcomes and “... without support from the curriculum around what to teach, and with the understanding that the new curriculum no longer required teachers to provide students with content, the pedagogy blocked the potential for learners to access formal school knowledge” (Hoadley, 2018:9). Due to poor performance of learners and public criticism, C2005 was revised and the National Curriculum Statement (NCS) was implemented in 2002. Hoadley (2018) argues that although some gains were made in the specification of knowledge, the NCS was a hybrid with contradictions. Teachers’ practice had shifted very little and research drew attention to the low level of localised, everyday knowledge that continued to dominate classroom interactions (Hoadley, 2018:10). Due to persisting inequalities in performance, the NCS was reviewed and the Curriculum and Assessment Policy Statement (CAPS) was developed. The CAPS, not only specified the content to be taught, but also the sequence, pace and assessment of knowledge to be implemented by teachers. The CAPS showed a decisive shift towards a knowledge-based curriculum and “a model of the teacher that is more realistic – teachers who required support with what knowledge to teach” (Hoadley, 2018:10).

The underlying epistemology of CAPS is social realism – that knowledge exists outside of the knower – and the teacher’s task is to enable learners access into the epistemic structure of the disciplines of knowledge. Neo-Bernsteinian social realism recognises educational knowledge as socially constructed but irreducible to power struggles in policy arenas (Liliedahl, 2015). According to social realists, educational knowledge can be understood as more than a power play between dominating and subordinate groups (Young, 2008). In a social realist approach

knowledge is neither universal nor is it a given, unmediated representation of the world; rather it is a fallible product under social, cultural and historical constraints. At the same time social realism is realist in the sense that knowledge is about something independently real in an objective

world beyond discourse. (Liliedahl, 2015:42; Maton, 2014; Wheelahan, 2010; Young, 2008)

In line with social realist epistemology, the CAPS for geography outlines topics that have traditionally been prescribed for the geography curriculum. This includes geographical skills and techniques, the atmosphere, geomorphology, population and water resources. For example, in the topic about the composition and structure of the atmosphere, the following sub-sections are specified:

- importance of the atmosphere
- the composition and structure of the atmosphere: troposphere, stratosphere, mesosphere and thermosphere
- the ozone layer – in the stratosphere
- causes and effects of ozone depletion, and
- ways to reduce ozone depletion (Department of Basic Education [DBE], Republic of South Africa [RSA], 2011).

Pedagogically, the NCS (DBE, RSA, 2011:4) advocates the principle of “active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths.” The CAPS requires more intellectually demanding content and pedagogy from teachers. For example, the geography curriculum aims at “[p]racticing essential transferable skills – literacy, numeracy, oracy and graphicacy; developing a commitment towards sustainable development; making and justifying informed decisions and judgements about social and environmental issues” (DBE, RSA, 2011:8).

The prescribed knowledge topics to be taught and the higher level intellectual skills show alignment with deep learning as arising from domain-specific content knowledge that enables cognitive advance.

Literature Review

More recent research of the geography curriculum shows teachers’ own subject knowledge to be wanting. Anyanwu, Le Grange and Beets (2015) researched teachers’ levels of knowledge in climate change science and found misconceptions about the climatic processes, causes of climate change and climate change impacts and solutions. They suggest professional development programmes and support interventions in teacher knowledge and understanding of climate change concepts.

Larangeira and Van der Merwe (2016) outline problems experienced by first-year geography student teachers associated with their own acquisition and understanding of map work. Furthermore, they argue that without deeper comprehensive development of their own map work content knowledge, the geography student teachers’ ability to teach map skills effectively will be adversely affected.

Research of the CAPS focuses on the key challenges articulated by teachers implementing the

new curriculum. These include a prescriptive curriculum in terms of formal and informal assessments; fast pacing of knowledge transmission and depleted teacher autonomy. Maddock and Maroun (2018) noted teachers' sense of failure and hopelessness in relation to local education. They found that teachers were disillusioned and used the following descriptions of CAPS: "focus is on all the unnecessary things, shockingly low, learners are forced through, marks are manipulated, learners' are set up for failure" (p. 199).

One of the teachers was dismayed "by the state of the students ... the lack of respect and their attitude." The "unnecessary things" referred to different forms of time-consuming paperwork which "take away teaching time." Furthermore "officials are ignoring teaching and focusing only on checking teachers' files" (Maddock & Maroun, 2018:199).

Research of C2005 practice by Harley and Wedekind (2004) show symbolic displays of principles of C2005. The evident group-work did not promote conceptual learning; and there was little reading and writing. Learner's responses were accepted as valid irrespective of their accuracy or relevance. Similarly, research of the CAPS in language and mathematics classrooms showed that "teachers adopted surface features of the new curriculum without effecting real change in the learning possibilities in the classroom – what persisted was a surface treatment of content and tasks" (Hoadley, 2018:195). What had changed was that teachers had stronger control over the selection of knowledge content introduced in the classroom, the sequence or order in which content is introduced and over the pace or rate of transmission. There was weaker framing over feedback and "low demand for elaborated learner response and reasoning" (Hoadley, 2018:195). Hoadley also found that there were more clearly bounded subjects, minimal references to other subjects and to learners' everyday knowledge and experience; very little content was covered across long periods of time and there was no differentiation in the pedagogy for slower and faster learners (p. 192). In addition, there was very little writing in the classrooms. In the language classes observed, most lessons entailed writing five to 10 single words while sentences and paragraphs were seldom written. Teachers did not elaborate on why things were done, on definitions or explanations of content and there was a lack of elaborated verbal responses from learners (Hoadley, 2018:193).

Theoretical/Conceptual Framework

The pedagogic device was motivated by the question: "Are there any general principles that regulate the transformation of knowledge into pedagogic communication" (Bernstein, 2000:25).

For Bernstein, pedagogic discourse is "a fundamental social context through which cultural reproduction-production takes place" (Bernstein, 2000:3). Therefore, to identify causes for the reproduction of the poor achievement of learners from poorer backgrounds, one needs to analyse pedagogic discourse in the classroom or the actual structure of pedagogic discourse that enables power to be relayed. Without an analysis of pedagogic discourse, "there is no way in which we can understand the way in which knowledge systems become part of consciousness and how pedagogic processes shape consciousness differentially" (Bernstein, 2000:3).

Bernstein is concerned about the differential distribution of forms of knowledge and consciousness to different social classes and argues that pedagogic discourse either enhances or denies opportunities to learn the pedagogic code of the school. For learners coming from the working class or poorer contexts, the school is the only pedagogic site for them to acquire the elaborated pedagogic code. Such learners' discourse in their homes is narrative, and their tendency is to select a non-specialised recognition rule. Thus teachers have a more challenging role to play to enable acquisition of the pedagogic code of the school. Learners need to learn that school discourse differs from home and they must be taught to select a specialising recognition rule in response to tasks and activities. The need to learn that pedagogic discourse valued and rewarded at school is vertically structured, elaborated, analytical, context-independent and syntactic. Pedagogic discourse is a site for learning an orientation to meaning that is abstract, generalisable and transferable. Learners need to be taught in ways that are elaborated, illustrating verticality so that more opportunities are provided for learning the elaborated code and for the specialisation of their consciousness.

Pedagogic discourse could be elaborated or restricted (Bernstein, 2000). Where the school draws on the working class or poorer learners, the school will adopt strategies that will affect the content of the transmission. The content is likely to stress operations and local skills rather than the exploration of principles of the subject, its internal conceptual interconnections and its general skills – a lexical pedagogic code where one-word answers or short sentences relaying individual facts/skills/operations are more likely. This pedagogic code is more typical of the school class of marginal, working class or poorer learners. A syntactic pedagogic code relaying relationships, processes, and connections may be more typical of the school class of middle-class children, (Bernstein, 2000).

Taylor's (2009) tabulation of Bernstein's distinction between restricted and elaborated codes has been adapted for this research.

Table 1 Restricted and elaborated codes

Criteria	Restricted code	Elaborated code
Language	Everyday language	Formal language
Relation to material base	Specific, direct	Less specific, more indirect
Communication modality	Narrative	Analytical
Relation to context	Context-dependent	Context-independent
Textual attributes	Dominantly lexical: one-word answers or short sentences, relating individual facts/skills/operations	Dominantly syntactic: relating relationships, processes and connections
Orientation to meaning	Abstract, indirect relation to context, analytical	Practical, direct relation to context, narrative

Young (2010) argues that the traditional subject-based curriculum should be differentiated in terms of a curriculum of compliance and a curriculum of engagement. What differentiates a curriculum of engagement is that subjects like geography are conceptualised as dynamic entities that change over time – they are not part of a fixed canon defined by tradition with unchanging contents, although subjects do have a canon of agreed texts, concepts and methods. The traditional model treats knowledge as “given” that learners need to comply with, whereas engagement requires of learners to not just comply with specific rules and contents as if they were instructions, but to join communities of specialists that guarantees links with disciplines and the production of new knowledge that bridges everyday concepts to theoretical concepts in different subjects; and creates possibilities for identity generation for teachers and learners. According to Young (2013) powerful knowledge is specialised in how it is produced and how it is transmitted. It is also different from the everyday knowledge that learners bring to school (Bertram, 2019). Powerful knowledge is epistemically structured. The essential effect of powerful geography knowledge is learning to think conceptually and critically (know-that). Pountney and McPhail (2019) explicate that the power is in both the concepts themselves and their interrelationships in systems of meaning, and in the potential to advance learners’ powers of thinking, imagination and “know-that” (Pountney & McPhail, 2019:488).

It is through a curriculum of engagement (Young, 2010) that deep learning is enabled and through which access to powerful knowledge and cognitive advance is afforded. Whether knowledge

is powerful or exclusionary depends on how it is taught and what the learner is then able to do with it (Hoadley, 2018). She thus suggests a relational approach between curriculum and pedagogy or knowledge in pedagogy.

Engaging with geographic knowledge encompasses three systematic steps in the process of making meaning of the experiential world. In the next section I analyse the epistemic structure of geography.

Gaining access to powerful geography knowledge involves observing, classifying, and explaining the experiential world. Mediating powerful knowledge in geography requires teachers to create opportunities for learners to make order and meaning of the experiential world through observing, classifying, and explaining phenomena (Wignell, Martin & Eggins, 1993). The first procedure to uncover this order and meaning is to observe and describe the experiential world through a technical lexis. The technical lexis refers to the use of terms or expressions within geography that have a field-specific meaning. The technical terminology that is core to the field is the means, not only for making sense symbolically, but also for more generally accepted geographic meaning to be attributed to objects and experiences. This first step of relating to learners’ experience, or directing their experience, aims at identifying and relating the individual perceptual experience to an abstract, socially accepted description. Technical terms are elaborated by using other synonyms and words to define the phenomena. “Phenomena less accessible to the senses require more elaboration than tangible physical phenomena such as buttes” (1993:169). Such phenomena are often defined through a “possessive attributive process”, which means definition through an accumulation of attributes. Bernstein (2000:27) invokes the notion of an “ideal universe of potential pedagogic meanings” that are communicated in “ways to either restrict or enhance their relationships.”

The power of geography as a symbolic form arises from its structure. Wignell et al. (1993) hold that the structure of geographical knowledge is that it is made up of many concepts that are interconnected. The conceptual taxonomies arise from two principles of classification: *superordination* where something is a type of something else and *composition* where something is a part of something else. The first principle, superordination, places the concept in a hierarchical classification. It tells little about the thing itself but enables it to be placed in an ordered system of oppositions in relation to other things. The following is an example of super-ordination: there are three types of rocks – igneous, metamorphic and sedimentary rocks. This principle of classification extends a general concept into its specific types. The second principle of

classification, composition, refers to where something is classified as being a part of something else. It gives detailed description about something but nothing about its relationship to other similar things. For example, sedimentary rock is rock formed from fragments of other rocks that have been compressed and hardened over time. Together, both principles of classification, superordination and composition, provide a vertical and horizontal classification of concepts that define the structure of that particular knowledge area.

The third geographic procedure to uncover order and meaning is to explain how phenomena came to be the way they are through implication sequences of cause and effect. Technical terms are introduced and defined through an identifying relational clause: an x (technical term – mesas) is a y (definition – flat mountain with steep sides). Technical terms are also defined through causal relations between phenomena. In elaborating on a technical term an additional task is explaining how it got to be that way.

Methodology

This article forms part of a larger study examining pedagogic discourse in different subject classrooms during the implementation of the CAPS. In this article I focus on the shift towards a social realist epistemology in the CAPS. I focus on how teachers mediate the epistemic structure of the Grade 10 and 11 geography curriculum to understand how the three attributes of powerful geography knowledge, observe, classify, and explain the experiential world, are mediated. The specific questions that framed data collection and analysis in terms of the three attributes were: How do teachers activate learners’ observational skills and how do teachers relate the topic to the experiential world of learners? How do teachers teach the vertical and horizontal conceptual structure of geography? How do teachers provide geographic explanations for how the phenomena are changing?

It is widely known that stark racialised inequalities persist in educational achievement in South African schools (Spaull, 2013; Taylor, Van der Berg & Mabogoane, 2013; Van der Berg, Spaull, Wills, Gustafsson & Kotzé, 2016) Thus, Hoadley notes that there are “significant racial disparities in schooling outcomes still prevalent in the system” (Hoadley, 2018:6); around 80% of schools serve poor black communities and produce very weak outcomes, and 20% are mostly former white and currently multiracial, middle-class schools that produce good outcomes (Hoadley, 2018:7). Three lower-performing schools were selected for the study. These schools were typical of the majority of South African schools that serve poor Black communities. Access to one of the schools and teachers was facilitated by a district official. The second school was referred to me by a

teacher participant at the first school. The third school was referred to me by a teacher at the second school. The teacher participants were met first to discuss the research and data collection strategies. They were informed that the data would only be used for research purposes, that confidentiality and anonymity would be upheld and that they might withdraw from the research if they needed to. Teachers were informed that three consecutive lessons would be observed, that field notes would be made during the lessons, that classroom discourse would be audiotaped and that an interview with them after the third observation would be done. All teachers willingly gave their consent for the observations and post-observation interviews.

Based within the qualitative research paradigm, non-participant observations of three Grade 10 and 11 geography lessons were carried out in order to derive the common essential attributes of the lessons: the conceptual structures taught, and the terminology and explanations provided. Field notes were also made and learning resources were collected to enable reconstruction of the lesson as it unfolded in the classroom. Teachers’ lessons were also audio recorded.

Post-observation interviews were conducted. The interview guide consisted of open-ended questions that were employed flexibly in the interview. Beyond the guide, key aspects mentioned by teachers were probed further.

The concepts informing the study were operationalised into indicators to aid data analysis.

Table 2 Analytical framework

Concept	Indicators
Observation of the experiential world	The extent to which teachers require learners to observe the experiential world
Naming and describing using technical lexis	The extent to which teachers name and describe phenomena using the technical lexis
Classification of concepts	The extent to which teachers classify concepts vertically and horizontally
Explanation of the experiential world	The extent to which teachers provide geographic explanations for phenomena
Pedagogic discourse	The extent to which pedagogic discourse is elaborated or restricted
Deep learning	The extent of cognitive demand: seeking meaning, relating and extending ideas, looking for patterns and underlying principles, checking evidence and relating it to conclusions, examining arguments cautiously and critically and becoming actively interested in course content
Curriculum of compliance	The extent to which knowledge was mediated as “given”

All teachers taught the topics prescribed in the CAPS for the third term of the year. The lesson topics also indicate implementation of pacing prescribed by the geography CAPS. Data analysis shows that all teachers adhered to selection, sequencing, and pacing prescribed by CAPS. Teachers adhered to the CAPS in terms of knowledge content introduced in the classroom, the sequence or order in which content was introduced and over the pace or rate of transmission. Under the Grade 10 topic, population movements, the following sections were taught: kinds of population movement: international migration, emigration, immigration; regional migration, rural-urban migration, urbanisation, voluntary and forced migration; causes and effects of population movements; temporary and permanent movements including migrant labour, economic migrants, political migrants, and refugees; and attitudes to migrants and refugees. The CAPS prescription, “using case studies to illustrate topics is essential”, was not followed in the majority of the lessons.

In the Grade 11 classes teachers similarly taught the section specified for the third term: trade and development. The concepts taught were: international trade and world markets, commodities traded, terms of trade, types of trading relationships, free trade, trade barriers, subsidies, fair trade and the concept of globalisation and its impact on development, and export-led development. Here again, the prescription in the CAPS that each topic is “critically examined with examples from around the world” was not followed in the majority of the lessons.

The topics were more clearly bounded, there were no references to other subjects while there were references to learners’ everyday knowledge and experiences.

The general pattern of the lessons observed included the use of smartboards to project key concepts and definitions on the topic; the use of questioning by the teacher and answering by learners throughout the lesson; and learners answering set questions in their notebooks.

Divergence from pedagogy for deep learning and engagement with content knowledge revolved around the transmission of the epistemic criteria of geography, opportunities for deep learning, and knowledge presented as “given.” These aspects are further discussed in the sections that follow.

Results/Findings

The Epistemic Structure of Geography in the Classroom

Observing the experiential world

Of the lessons analysed, in many learners were required to engage in empirical observation and to describe their observations using technical lexis. Observations were of three types: videos, posters and actual places near the school that learners were familiar with. Video projections were facilitated by

smartboard technology available in most lessons. For example, in one lesson the teacher projected pictures of migrants in refugee camps engaging in cooking; another projected pictures of rural and urban areas and attempted to relate this to reasons for rural-urban migration. In another lesson on environmental degradation due to development the teacher showed a video of the forms of global warming: climate change, deforestation, air pollution, thermal nuclear pollution, overfishing, landfill dumps, mining sand dunes, and oil rig accidents. Another teacher projected a news clip of the recent shooting of a shopkeeper of Somali origin in Soweto and of looting and burning of foreign-owned shops in Soweto, while yet another teacher projected a video on how rapidly humans were degrading the earth. These videos were very effective in outlining the issues and providing information on them. In classrooms where smartboard technology was not available, posters were shown. One teacher showed a poster of people with human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) disease. Another showed pictures of the three states of water. Real-world examples of overpopulation in an informal settlement were also referenced. Another teacher referred to an informal settlement in the vicinity of the school to illustrate what overpopulation means.

The lessons referenced the technical terms to name and describe the observations. Lessons on development included terms such as primary, secondary and tertiary activities; commercial and subsistence farming; more economically developed countries (MEDCs); less economically developed countries (LEDCs); the Brandt line; gross domestic product (GDP); gross national product (GNP); human development index (HDI); Gini coefficient; and social indicators of development such as life expectancy and infant mortality. Lessons on population movements were structured by terms such as migration, immigration, emigration, international migration, rural-urban migration, voluntary and involuntary migration. Key technical terms on trade and development such as international trade, tariffs, subsidy, quotas, commodities, raw materials, finished products, terms of trade, balance of trade, free trade, trade barriers, trade blocs, globalisation, and market were referenced and used to describe the phenomenon. Similarly, lessons on overpopulation included terms such as carrying capacity, overconsumption, resource depletion, renewable resources, non-renewable resources and sustainable development.

Classifying the experiential world

Generally, teachers did develop conceptual classification structures that showed different depths and enhancements. A common classification observed was super-ordination where a concept is

further classified into its types. For example, population migration was classified into different types of migration:

T: *There are different types of population migration: regional, international and rural-urban migration.*

Similarly, trade was further classified into types of trade:

T: *There are different types of trade. Can anyone tell me the different types of trade?*

L: *Regional trade, international trade, BRICS [Brazil, Russia, India, China, South Africa] trade.*

The second classification of concepts: composition, where a concept is further defined, was also commonly done. For example, international migration was further defined by the teacher:

T: *What is international migration? Refers to population movements across national boundaries.*

In the topic trade in the Grade 11 classrooms the concept of the market was further defined:

T: *The term 'market' is not a physical space or building but a set of systems and structures that makes international trade possible.*

Explaining the experiential world

The third dimension of powerful geography knowledge was also noted in the lessons. In the Grade 10 classrooms teachers discussed reasons for population migration in terms of forced and voluntary migration and for rural-urban migration in terms of push-pull factors. These explanations were given as simple, universal facts.

The explanation for population movement given in one class:

T: *What is the reason for people to move?*

L: *Job opportunities.*

T: *Yes, what are other reasons?*

L: *Urban areas are more advanced.*

Teachers used transition networks such as arcs and arrows to show what immigration and emigration are. Transition networks were also used to explain the components of the hydrological cycle – precipitation, evaporation, and condensation.

The Grade 11 teachers also provided explanations for why trade takes place:

T: *Why is trade important?*

L: *Meet each other's needs.*

While the three aspects of the discourse of geography – observe, order, and explain the experiential world – were evident in the lessons, the restricted pedagogic discourse of teachers diminished opportunities for deep learning and engaging with knowledge contents.

Pedagogic Discourse

While the CAPS specifies the topics and sub-topics to be taught; pedagogic elaboration, extension and analysis of the topics in greater depth are left to the discretion of the teacher. Pedagogic discourse refers to pedagogic communication that aims to facilitate learning of the pedagogic code. It includes explanations, narratives, examples, co-extensions

of concepts, illustrations, questioning by the teacher, and identifying and correcting misconceptions. Pedagogic discourse may be extended or restricted. The pedagogic discourse of the lessons leaned towards restricted pedagogic discourse and needed to be more extended and more elaborated to facilitate deep learning and cognitive advance. Generally, the definition of terms was through a single attribute in short, restricted ways. For example, in Grade 11 the term “tariff” was defined:

T: *What are tariffs? Tariffs are taxes imposed on imported goods.*

There was no attempt by the teacher to prompt and probe learners' understanding of terms. Examples of tariffs imposed on goods traded were not presented nor analysed. On the topic, trade, in a Grade 11 classroom, the concept of the market was defined:

T: *The term 'market' is not a physical space or building but a set of systems and structures that makes international trade possible.*

The above definition of market was not elaborated on nor analysed into its component parts to ensure learning of new knowledge. Examples of systems and structures that govern international trade were not given. What learners understood or didn't understand was not evident. Even when terms were defined through more than one attribute, the short phrases persisted. For example:

T: *Commodities are goods traded. This could be raw materials or finished products.*

Teachers did not require learners to participate in the social construction of meaning. Factual statements were made by teachers and accepted by learners.

The indicators of deep learning were not evident in the lessons. Learners were not required to construct meaning, relate and extend ideas, look for patterns and underlying principles, check the evidence and relate it to conclusions, examine arguments critically and engage with knowledge content. Both the topics, trade and population migration, are frequently in the news. More examples and analysis of current migrations and trade issues would enable greater opportunities to understand the complexities associated with these topics. It would also provide the context for critical discussion. Instead knowledge was presented as “given”, thus actualising a curriculum of compliance. Furthermore, conceptual depth and breadth were very limited. The curriculum prescription in Grade 10 of “using case studies to illustrate topics” in the section on population migration that would have enabled application of concepts to real-world contexts was not done in the lessons. Similarly, the CAPS requirement in Grade 11 that topics must be “critically examined with examples from around the world” was not done in any of the lessons. Another factor that led to restricted pedagogic communication was that

teachers covered very little conceptual content in the lesson.

Teachers' Views of the CAPS

Appreciation of specification of content in the CAPS
Generally, teachers were familiar with the surface aspects of curriculum policy. The support provided to teachers by CAPS in terms of what to teach was welcomed and adopted by all the teachers observed. Teachers also found the CAPS statement very clear, "straight to the point" as shown below:

P: *How is CAPS helpful to you?*

L: *CAPS is very straight to the point, very easy to understand. Everything that I need is there. So it's like black and white, straight to the point. There is nothing confusing about it. I think they also aligned it to the learners' guide so it is easy to use. The teachers' book you use it when you do not know. I never struggle.*

Teachers accepted the emphasis on knowledge in the CAPS and they were generally satisfied with the CAPS document:

S: *The aspects of CAPS document I think in terms of knowledge is that it has clear content that is well organised. It also has specific aims for every subject that have to be achieved at the end of every specified time and. Thirdly, it also has concepts that guide teachers, and lastly it has skills to be taught.*

However, none of the teachers had any understanding of the deeper epistemological assumptions underpinning the CAPS curriculum reform.

Subordination of Conceptual Knowledge to the Real-Life Experience of Learners

All teachers identified the goal of their pedagogic discourse as relating content to the real-life experiences of learners. For example, the following response from one of the teachers was common among the teachers:

I: *How does CAPS differ from the previous curriculum?*

T: *CAPS is about relating the classroom content with the real-life experiences of learners – and also considering the lesson objectives – we have to see to it that we cover the objectives.*

In attempting to make connections with the real-life experiences of learners superficial examples were used. In a lesson on trade a teacher commenced with a role play. He brought groceries into the classroom, then selected learners who would represent different countries and proceeded to link all content in the lesson to the role play. The role play conveyed the idea of the exchange of goods but failed to transcend the role play into acquiring the general conceptual structure that describes trade among countries. The discourse stagnated at the simplistic level of common sense and failed to provide a bridge to conceptual knowledge and to the current complexities of trade among countries. Critical and creative thinking that would enable

transfer of knowledge to new situations was conspicuously absent from the lessons.

Discussion and Conclusion

While the participants complied with the surface aspects of the curriculum in terms of selection, sequencing, and pacing of knowledge, they need to be introduced to the epistemological shift in CAPS. The social realist knowledge assumptions underpinning the CAPS curriculum, that knowledge is realist and about real geographic phenomena in an objective world was not evident in participants' responses in the interviews nor in their lessons. A possible explanation could be personal epistemologies more inclined towards constructivism and relativism rather than social realism, which, in turn will impact their mediation of knowledge to learners. Generally knowledge was presented as "given", and teachers' pedagogic discourse was not directed towards enabling learners to engage with the curriculum. Furthermore, there was no evidence of deep learning and active higher-order thinking. The findings of this research echo Hoadley's (2018) conclusion that teachers have adopted surface features of the new curriculum without effecting real change in the learning possibilities in the classroom. These teachers did not elaborate on explanations, definitions or explanations of content and there was a lack of elaborated verbal responses from learners.

The participants' intentional subordination of conceptual knowledge to the real-world experience of learners hinders acquisition of context-independent conceptual knowledge by learners. A possible explanation could be misconceptions of subject knowledge as put forward by Anyanwu et al. (2015) or inadequate development of their own content knowledge as suggested by Larangeira and Van der Merwe (2016).

The participants have not conceptualised geography as a discipline concerned with making order and meaning of the experiential world, through observing, classifying, and explaining phenomena (Wignell et al., 1993). Each of these intellectual procedures was either absent or brought down to simple facts. The CAPS requirement that the knowledge content be critically examined with examples from around the world was not evident in most lessons.

To enable deep learning teachers need a panoramic view of the subject (McPhail, 2020). To be able to teach the epistemic structure of geography as powerful knowledge teachers need to be fluent with the specialised knowledge structure of geography. This would enable them to develop and teach the technical terminology, conceptual interconnections and explanations of the subject in a coherent way. A shift to a curriculum of engagement and how geography could become

powerful knowledge is necessary to enable learners to think conceptually and critically. Teacher education ought to include deep engagement with geography as a knowledge structure based on observing, classifying, and explaining the experiential world. Mediating powerful knowledge in geography requires of teachers to create opportunities for learners to make order and meaning of the experiential world through observing, classifying, and explaining phenomena. Secondly, teachers require a critical grounding in the epistemological assumptions underpinning knowledge such as positivism, constructionism, social realism and relativism and the shift to a social realist epistemology in the CAPS.

This study commenced with exploring opportunities for deep learning and cognitive advance in Grade 10 and 11 geography classrooms within the new CAPS policy. Hardly any opportunities were evident for learners to deeply learn the depth and breadth of the topics and practice higher-order thinking skills. On the contrary, very little content was taught for the time allocated and content was simplified into short simple sentences. Relating, extending, and interrogating ideas so that an elaborated pedagogic code is realised, was missed. In all lessons learners were not required to, nor did they contribute elaborated verbal responses. Furthermore, reading, comprehension and analysis of printed learning materials was not evident. The writing was reduced to two or three words in response to low-order questions in their notebooks.

The study provides evidence for Bernstein's theory of the differential distribution of forms of knowledge and consciousness to different social classes. The pedagogic discourse focused on in this study denies opportunities to learn the pedagogic code of the school. Since the school is the only pedagogic site for learners coming from poorer contexts to acquire the elaborated pedagogic code, it is more than likely that these learners would not acquire geography as powerful knowledge. While Bernstein argues that poorer learners select a non-specialist recognition rule, it was evident that the pedagogic discourse of the participants was not as specialised as required for deep learning to take place. The pedagogic discourse analysed was minimally elaborated on and analytical, and compromised opportunities for learning an orientation to meaning that is abstract, generalisable, and transferable. Hoadley (2018) explains that in developing-country contexts one cannot assume that teachers are specialised. "Teachers enact pedagogy with evident low levels of specialised knowledge. Thus teachers may be "... an obstruction in the process of knowledge becoming pedagogic communication" (Hoadley, 2018:215).

While the new government has provided teachers with a scripted curriculum in the form of the CAPS, learner guide and teacher guide, this research of opportunities for deep learning in geography classrooms shows that developing teachers' academic knowledge of the epistemic structure of geography is needed. But, according to the Council on Higher Education (CHE), there has been very limited significant, sustained or successful programmes to increase teachers' knowledge across the system in the last 22 years (Soudien, Faller, Harley, Menon, Metcalfe, Le Grange, Ramrathan & Schäfer, 2010). Much more needs to be done in the area of increasing and deepening teachers' subject content knowledge so that they may know and be able to teach the epistemic structure of the subject.

The subordination of conceptual knowledge to the real-world experience of learners requires further research. What are the personal epistemologies of geography teachers that lead to the subordination of conceptual core content knowledge to common sense and everyday experiences of learners? Furthermore, does geography-teacher education provide students with an understanding of the epistemic structure of geography? In conclusion, it is likely that teachers need greater immersion in education theory and policy so that "they will be able to make up their own minds with that knowledge of the issues at stake" (Durkheim, 1977:4):

It is not enough to prescribe to (teachers) in precise detail what they will have to do, they must be in a position to assess and appreciate these prescriptions, to see the point of them and the needs which they meet. In brief they must be familiar with the problems for which these prescriptions provide provisional solutions. This means that it is essential to initiate them into the great problems involved in education for which they will be responsible, no less than the methods whereby it is proposed to solve them so that they may be able to make up their own minds with that knowledge of the issues involved. Such an initiation can only come from a study of educational theory. (Durkheim, 1977:4)

Notwithstanding the above recommendations, the explanatory scope of school-related factors alone is limited and need to be located within binding structural constraints that continue to plague current teaching and learning in poorer South African classrooms.

Notes

- i. Published under a Creative Commons Attribution Licence.
- ii. DATES: Received: 26 July 2019; Revised: 8 February 2020; Accepted: 9 April 2020; Published: 31 May 2021.

References

- Anyanwu R, Le Grange L & Beets P 2015. Climate change science: The literacy of Geography teachers

- in the Western Cape Province, South Africa. *South African Journal of Education*, 35(3):Art. #1160, 9 pages. <https://doi.org/10.15700/saje.v35n3a1160>
- Bernstein B 2000. *Pedagogy, symbolic control, and identity: Theory, research, critique* (rev. ed). Oxford, England: Rowman & Littlefield.
- Bertram C 2019. What is powerful knowledge in school history? Learning from the South African and Rwandan school curriculum documents. *The Curriculum Journal*, 30(2):125–143. <https://doi.org/10.1080/09585176.2018.1557536>
- Department of Basic Education, Republic of South Africa 2011. *Curriculum Assessment Policy Statement Grades 10-12: Geography*. Pretoria: Author. Available at https://www.education.gov.za/Portals/0/CD/National%20Curriculum%20Statements%20and%20Vocational/CAPS%20FET%20_%20GEOGRAPHY%20_%20GR%2010-12%20_%20WEB_C9A9.pdf?ver=2015-01-27-154144-177. Accessed 9 April 2021.
- Durkheim E 1977. *Emile Durkheim selected writings on education* (Vol. 2). Translated by P. Collins. London, England: Routledge & Kegan Paul Ltd.
- Harley K & Wedekind V 2004. Political change, curriculum change and social formation, 1990 to 2002. In L Chisholm (ed). *Changing class: Educational and social change in post-apartheid South Africa*. Cape Town, South Africa: HSRC Press.
- Hattie JAC & Donoghue GM 2016. Learning strategies: A synthesis and conceptual model. *npj Science of Learning*, 1:16013. <https://doi.org/10.1038/npjscilearn.2016.13>
- Hoadley U 2018. *Pedagogy in poverty: Lessons from twenty years of curriculum reform in South Africa*. London, England: Routledge.
- Larangeira R & Van der Merwe CD 2016. Map literacy and spatial cognition challenges for student geography teachers in South Africa. *Perspectives in Education*, 34(2):120–138. <https://doi.org/10.18820/2519593X/pie.v34i2.9>
- Liliedahl J 2015. The recontextualisation of knowledge: Towards a social realist approach to curriculum and didactics. *Nordic Journal of Studies in Educational Policy*, 2015(1):27008.
- Maddock L & Maroun W 2018. Exploring the present state of South African education: Challenges and recommendations. *South African Journal of Higher Education*, 32(2):192–214. <https://doi.org/10.20853/32-2-1641>
- Maton K 2014. *Knowledge and knowers: Towards a realist sociology of education*. London, England: Routledge.
- McPhail G 2020. The search for deep learning: A curriculum coherence model. *Journal of Curriculum Studies*. Advance online publication. <https://doi.org/10.1080/00220272.2020.1748231>
- Pountney R & McPhail G 2019. Crossing boundaries: Exploring the theory, practice and possibility of a 'Future 3' curriculum. *British Educational Research Journal*, 45(3):483–501. <https://doi.org/10.1002/berj.3508>
- Soudien C, Faller F, Harley K, Menon K, Metcalfe M, Le Grange L, Ramathan P & Schäfer M 2010. *Report on the national review of academic and professional programmes in education*. Pretoria, South Africa: Council on Higher Education. Available at https://issuu.com/jacanamedia/docs/che_teacher_review_book. Accessed 17 April 2021.
- Spaull N 2013. *South Africa's education crisis: The quality of education in South Africa 1994-2011*. Johannesburg, South Africa: Centre for Development & Enterprise. Available at <http://www.section27.org.za/wp-content/uploads/2013/10/Spaull-2013-CDE-report-South-Africas-Education-Crisis.pdf>. Accessed 7 April 2021.
- Taylor N 2009. The state of South African Schools Part 1: Time and the regulation of consciousness. *Journal of Education*, 46:9–32. Available at http://joe.ukzn.ac.za/Libraries/No_46_June_2009/Completeissue_No_46.sflb.ashx#page=13. Accessed 7 April 2021.
- Taylor N, Van der Berg S & Mabogoane T (eds.) 2013. *Creating effective schools*. Cape Town, South Africa: Pearson.
- Van der Berg S, Spaull N, Wills G, Gustafsson M & Kotzé J 2016. *Identifying binding constraints in education*. Stellenbosch, South Africa: Research on Socio-Economic Policy, Department of Economics, Stellenbosch University. Available at https://resep.sun.ac.za/wp-content/uploads/2016/05/PSPPD_BICiE-email.pdf. Accessed 8 April 2021.
- Wheelahlan L 2010. *Why knowledge matters in curriculum: A social realist argument*. London, England: Routledge.
- Wignell P, Martin JR & Eggins S 1993. The discourse of geography: Ordering and explaining the experiential world. In MAK Halliday & JR Martin (eds). *Writing science: Literacy and discursive power*. Washington, DC: The Falmer Press.
- William + Flora Hewlett Foundation 2013. *Deeper learning defined*. Available at <https://hewlett.org/library/deeper-learning-defined/>. Accessed 8 April 2021.
- Young M 2013. Overcoming the crisis in curriculum theory: A knowledge-based approach. *Journal of Curriculum Studies*, 45(2):101–118. <https://doi.org/10.1080/00220272.2013.764505>
- Young MFD 2008. *Bringing knowledge back in: From social constructivism to social realism in the sociology of education*. London, England: Routledge.
- Young MFD 2010. The future of education in a knowledge society: The radical case for a subject-based curriculum. *Journal of the Pacific Circle Consortium for Education*, 22(1):21–32. Available at http://programs.crdg.hawaii.edu/pcc/PAE_22__1__final_10.pdf#page=21. Accessed 7 April 2021.