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Teaching thinking in South African schools: Selected school leaders' perceptions

Lena Green  and Karen Collett 

Faculty of Education, University of the Western Cape, Cape Town, South Africa
kcollett@uwc.ac.za

In this article we argue that school leaders should ensure that teachers experience a supportive professional learning community committed to collaborative, thoughtful inquiry and be enabled to create similar communities in their classrooms. This study followed on one published in 2017 that explored school leaders' responses to an introduction to cognitive education. The same participants investigated cognitive education practices (ways of teaching thinking) in their schools, with an emphasis on the factors that facilitated or constrained implementation. Using a qualitative research approach an open-ended research assignment in the form of a report was completed by 32 teachers in school leadership positions. The data was analysed using the guidelines of grounded theory to identify key themes. The findings suggest a possible starting point for leadership initiatives, although cognitive education practices in the participating schools were constrained by a number of structural, contextual and personal factors. Discussion highlights the importance of the development of professional learning communities that focus on cognitive education and identifies a possible leadership direction, namely, building on the progress already made in training teachers to apply Bloom's taxonomy to assessment tasks. Although our data is from schools in one area of South Africa, our conclusions are likely to have implications for school leadership generally, with particular reference to the development of classroom and professional thinking and learning communities.

Keywords: Bloom's taxonomy; cognitive education; curriculum leadership; professional learning communities; teaching thinking

Introduction

In this article we draw on the literature from two historically separate areas of scholarship and on our data to point out some parallels between developing thinking and inquiry skills in classrooms and in staffrooms. We argue that leaders in schools need to be better informed about actively teaching thinking (cognitive education) and about teacher development in order to capacitate teachers as mediators of thinking. Secondly, we draw attention to our research participants' focus on Bloom's taxonomy (first published in 1956 and revised by Anderson & Krathwohl in 2001) as an assessment strategy and suggest that introducing this, or any other taxonomy of cognitive skills for assessment purposes only, is unlikely to be successful in improving thinking, unless both teachers and learners are also actively equipped with the skills to generate and answer questions at a range of cognitive levels. Although authors such as Killen (2007) provide valuable pedagogical suggestions, they do not directly focus on thinking processes, the development of metacognitive awareness and the conscious independent application of thinking strategies, which is the aim of cognitive education.

Context and Rationale

Education in South Africa has a complex context, historically shaped by colonial priorities and the policy of apartheid. When the country became a democracy in 1994, a complete reform of education was considered essential, resulting in, inter alia, a new national curriculum first formulated as Curriculum 2005 in March 1997, revised in 2000 as the National Curriculum Statement (NCS), which was streamlined in 2011 as the Curriculum and Assessment Policy Statement (CAPS) (Department of Basic Education (DBE), Republic of South Africa (RSA), 2012).

The CAPS currently guides teaching in all state schools in South Africa. Progress in implementing the new curriculum has been slow for many reasons, some more obvious than others. Chisholm and Leyendecker (2008:195) suggest that, in addition to overwhelming practical difficulties, "the failure of implementation could lie in expectations that education would lead to transformation without paying necessary attention to implementation and capacity."

In this article we are concerned with one of the curriculum requirements that seems particularly difficult to implement. The CAPS curriculum expressly requires that learners develop as critical and creative thinkers. Evidence that South African learners are not yet developing as thinkers comes from studies of the Progress in International Reading Literacy Studies (PIRLS) (Howie, S, Combrinck, Roux, Tshele, Mokoena & McLeod Palane, 2017; Howie, S, Venter, Van Staden, Zimmerman, Long, Du Toit, Scherman & Archer, 2008). These studies of literacy assess inferencing as well as retrieval and reproduction. The latest statistics indicate that South Africa's Grade 4 learners' achievement was the lowest of the 50 international education systems participating. Trends in International Mathematics and Science Study (TIMSS) achievement present a similar picture. Within the group of lowest performing countries, South African learners scored the lowest of the 39 participating countries in science and second lowest in mathematics (Reddy, Visser, Winnar, Arends, Juan, Prinsloo & Isdale, 2016).

Concurrently, the South African Standard for Principals (DBE, RSA, 2015) requires that school leaders develop their schools as learning organisations. The goal is to establish professional learning communities that can engage in reasoned dialogic enquiry about teaching and learning at their schools. The literature suggests that the skills required are not significantly different from those recommended for classrooms by the proponents of cognitive education. It would, therefore, serve a dual purpose if school leaders introduced and supported cognitive education initiatives. It follows that it is important to explore what is possible in local schools and how school leadership might begin to influence the thinking processes of entire school communities.

Research Problem

School leaders are central to the success of any initiative to teach thinking in schools but little is known about current practices around the teaching of thinking (referred to in this article as cognitive education) in South African schools, of which the majority are under-resourced. Our study was undertaken in order to explore selected school leaders' perceptions of the teaching of thinking in their own schools and of the factors that either facilitate or constrain this process.

Literature Review

As explained above, we draw on two distinct areas of scholarship, each of which is presented separately, after which the conceptual framework we have developed (Figure 1) illustrates the connections we perceive between them.

Cognitive education

There are many different kinds of thinking and many different words to describe them, which leads to considerable confusion about terminology. There are also many different ways of teaching thinking, some of which have been around for several generations. Cognitive education is the name given to an approach based on the assumption that it is possible to identify and nurture a range of lower and higher-order human cognitive processes that facilitate successful learning, planning and problem solving. It aims to sharpen and make conscious or visible the many cognitive processes involved in critical and creative thinking and to mediate mental tools for thinking more effectively. To engage in cognitive education is to equip learners of any age with a language to reflect, not only on the content of their thinking, but also on the various cognitive processes involved in arriving at a belief or an answer to a question.

The research of Reuven Feuerstein, an Israeli professor of psychology, identified a list of essential cognitive functions, or skills, which, he maintains, can be acquired through a process that he named mediated learning (Feuerstein &

Feuerstein, 1991; Green, 2016; Lomofsky, 2014). He named his mediational practice "cognitive education" because it is a form of teaching in which students of any age learn how to learn. Cognitive education interventions involve sensitising learners to their own cognitive processing habits and strategies, extending their repertoire of cognitive functions (thinking skills) and developing their ability to employ these skills strategically in different contexts. Examples of basic cognitive functions are categorising and attending while hypothesising and reasoning are considered to be higher mental functions. The latter may, however, rely on effective lower-order functioning.

More recently, the term "cognitive education" is sometimes used to refer not just to the work of Feuerstein, but to any intervention that intentionally focuses on the thinking processes and dispositions that underlie successful learning and decision making (Green, 2014; Howie, D 2011). Some of the better known intervention packages are Instrumental Enrichment (Feuerstein, Rand, Hoffman & Miller, 1980), the CoRT Programme and Six Thinking Hats (De Bono, 1973, 1988), Habits of Mind (Costa & Kallick, 2009), Thinking Maps (Hyerle, 2014) and Visible Thinking (Ritchhart, Church & Morrison, 2011). Philosophy for Children (Lipman, 2009), another well-known programme designed for schools, has a different conceptual foundation but, among its other aims, is concerned to mediate what Gregory (2002:11) calls "the standard tropes of good thinking", usually in the form of linguistic tools for dialogic reasoning. Well-designed programmes to develop thinking are valuable resources but not, however, the only way of teaching thinking. Feuerstein argues that teachers can successfully mediate thinking processes in the course of teaching curriculum content if they create an appropriate learning climate. Some gifted teachers may intuitively mediate thinking and those who do not do so yet can develop new skills, if policy requires it and leadership provides the necessary informed support.

Approaches to teaching thinking derived from cognitive psychology are supported by research that provides evidence of human cognitive modifiability, primarily that of Feuerstein and his colleagues, for example Feuerstein, Feuerstein and Falik (2010), but also that of authors such as Doidge (2007) and Goldberg (2009). It has become clear that intelligence is not fixed but can be modified by appropriate mediation (Perkins, 1995). International studies report more successful and insightful academic achievement after the introduction of the intentional teaching of thinking (Moriyón, Botella, Centeno-Gutiérrez & Lamas, 2018, Topping & Trickey, 2007; Walters, 2018) and ongoing research commissioned by SAPERE

in the United Kingdom (<https://www.sapere.org.uk>). Small local studies such as that of Edries (2012), Permall (2007) and Roberts (2006) have shown that making learners aware of thinking and introducing thinking tools have positive results on both self-concept and learning. The evidence to date is consistent with the widely known ideas of Vygotsky (1962, 1978) who argues that intelligence develops through social interactions in language.

Walters (2018:37) writes: “With this evolving evidence of impact to illuminate our practice, it would appear that thinking really does matter if we are to get the best out of education.” If he is right, it is time to pay attention to thinking in South African schools. For this to be possible teachers need opportunities to acquire the necessary knowledge and to develop the skills to mediate thinking, ideally within professional learning communities supported by informed school leadership.

Curriculum leadership

Leadership has a key influence on learners’ learning and achievement and on teacher development (Dempster, 2009; Leithwood & Jantzi, 2005). Curriculum leadership, sometimes referred to as instructional leadership, has a central role with regard to the introduction of cognitive education, particularly in countries with a strong emphasis in the curriculum on the development of critical and creative and analytical thinking. Instructional leadership is defined by Bush (2007:401) as “the leadership role that focuses on teaching and learning and on the behaviour of teachers in working with students.” Williams (2014) and Ylimaki (2012), however, consider curriculum leadership to be a broad concept subsuming, but not limited to, instructional leadership. The former argues that, while instructional leadership focuses on the quality of teaching and learning, curriculum leadership involves a broader responsibility including a concern for social justice and equity, which implies attention to organisational culture and the development of teachers as supportive communities of practice as described by Lave and Wenger (1991). Possibly because the notion of a community of practice is very broad, it has subsequently become usual to refer to such communities in schools as professional learning communities, or PLC’s.

A PLC is defined by Bolam, McMahon, Stoll, Thomas, Wallace, Greenwood, Hawkey, Ingram, Atkinson and Smith (2005:145) as a community “with the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing student learning.” Definitions of a PLC by other scholars (Carpenter, 2017; DuFour, 2004; DuFour & Eaker, 2009; Harris & Jones, 2010)

emphasise learning about learning with a view to curricular and school improvement. Harris and Jones extend the definition to include a focus on driving change “within, between and across schools” (2010:173). The principal has been identified as having a key role to play in developing the climate and culture within which a PLC can flourish through, firstly, creating a mission statement; secondly, developing a vision; thirdly, developing value statements; and fourthly, establishing goals (Carpenter, 2017; Crow, 2008). Research findings (Blanton & Perez, 2011, Tam, 2015) show a correlation between the establishment of PLC’s and improved learner achievement and collegial relations. Baumfield (2017:122) writes that “the efficacy of teachers working as part of professional learning communities in raising the achievement of their students is endorsed by an exhaustive review of teacher development research commissioned by the International Academy of Education based in Geneva. The review concluded that establishing an integrated cycle of collaborative inquiry and knowledge building was the optimal means of promoting teacher development (Timperley, Wilson, Barrar & Fung 2008).”

Leadership in schools needs to play a key role in the development and sustainability of PLC’s (Hord, 1997). Hord argues that this requires a focus by leadership on the following aspects: staff engagement in decision-making process; a shared, communicated and/or “living” vision; staff cooperative learning, enquiry and implementation of such learning; observation and assessment of teaching of colleagues; and the development of an environment and human resources that support the vision of a PLC.

Dempster (2009:7), in a synthesis of the literature related to leadership and learner achievement, found the following key leadership practices to influence learning outcomes:

- negotiating an agreed and shared moral purpose
- facilitating disciplined dialogue
- planning, monitoring and taking account using a strong evidence base about learning in the school;
- engaging in and encouraging active professional learning;
- enhancing the conditions for learning with their teachers;
- coordinating, managing and monitoring the curriculum and teaching;
- practicing distributed leadership;
- understanding the context of their work and connecting with parent and wider community support for learning.

The challenge of establishing and sustaining PLC’s in schools should not be underestimated. Historically teachers have operated as individuals in their own classrooms. Caskey and Carpenter (2014) argue, based on their research in American schools, that many teachers continue to work in isolation and engage solely in individual

professional development. One possible response is the establishment of online PLC's, which Battersby and Verdi (2015) suggest, have the potential to address both teacher isolation and efficacy. Furthermore, teachers need time to think and a culture that supports a focus on deep-level learning in an ongoing way if they are to function as PLC's (Anfara, Caskey & Carpenter, 2012; Hudson, 2015; Hunzicker, 2010). Establishing the structural and cultural conditions within which a PLC can function to enable a depth of critical and reflexive learning remains a challenge both in South African schools and internationally (Gray, Mitchell & Tarter, 2014; Mahlutshane, 2018).

Concern has also been expressed about the quality of interactions within PLC's. Carpenter (2017:1069) asserts that there is "little consensus on what educators actually do in a PLC, in particular what educators do as part of the collaborative inquiry process to improve teaching and learning systems." DuFour (2004) cautions against the use of the term "PLC" in a professional community without the demonstration that learning is taking place, and Little (2002) raises concerns about PLC's that have a limited and uncritical engagement in their inquiry and may not inquire in a rational manner. A PLC and its leader need to value and promote a "willingness to question, to hold uncomfortable tensions, to be vulnerable with colleagues, to struggle, to challenge the status quo, and to pose problems" (Anfara et al., 2012:56). Ensuring that PLC's are supported to inquire critically is key. A number of useful protocols have been proposed to structure PLC's but central to all of them is each individual's ability to monitor his or her own thinking dispositions and reasoning processes and to engage respectfully with the thinking of others.

The Policy on the South African Standard for Principals (DBE, RSA, 2015) requires school leaders to play an active role in encouraging schools to establish PLC's. This requires the building of a trusting and collaborative culture and the institutionalisation of time for staff to meet, together with the skills necessary to lead and contribute to the process of shared critical and caring inquiry.

The parallel is obvious between some of cognitive education's recommendations for classroom practice and the characteristics of an effective PLC. In both cases the emphasis is on independent, critical and creative thinking in order to thrive (as individuals and as professionals) within the complexities of the information age and its globally-competitive environments. In both cases the cognitive and metacognitive skills and the dispositions that characterise members of a collaborative, dialogic community are highly valued and actively nurtured. The literature makes a compelling argument for curriculum leadership that develops and supports teachers as both thinkers and teachers of thinking.

Conceptual Framework

According to Mouton (1996) there are three types of conceptual frameworks, namely, typologies, models and theories, each of which can provide a framework that clarifies the relationships between concepts. Figure 1 shows the model that we developed to visualise how we perceive the relationship between key concepts, namely the South African curriculum, the development of both learners and teachers as communities of thinkers, and the role of school leaders in these processes, should be.

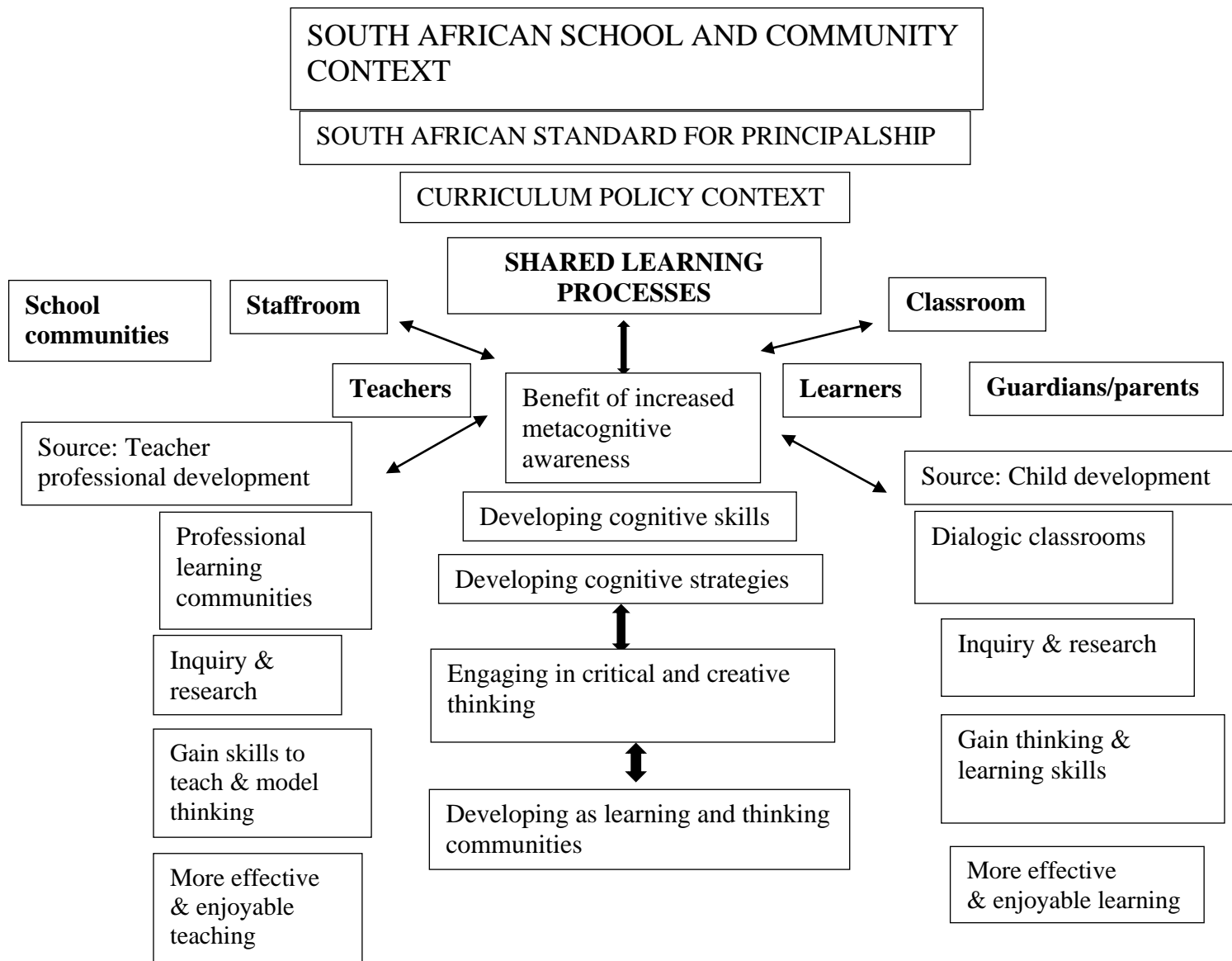


Figure 1 Conceptual framework – Model of a school learning community

Research Questions

We set out to address the following questions:
 What cognitive education practices to mediate thinking are currently practiced in participants' schools?
 What factors were perceived to facilitate the mediation of thinking in participants' schools?
 What factors were perceived to constrain the mediation of thinking in participants' schools?

Research Methodology

Research Paradigm

This was a relatively small qualitative study within the interpretivist paradigm, which aimed to access participants' understandings and interpretations of the school contexts in which they worked. Meanings were socially constructed both by the participants and by us as researchers. Our role was to "understand, explain, and demystify social reality through the eyes of different participants"

(Cohen, Manion & Morrison, 2007:19). Social reality is viewed as socially constructed and based on iterative processes of interpretation and reinterpretation of the meaningful behaviour of people (Denzin & Lincoln, 2000). The trends and patterns identified in this study may not be applicable to other contexts, as they represent the interpretations of these participants, reinterpreted by us.

Research Design

This was a small qualitative case study within the interpretive paradigm, which assumes that knowledge is socially constructed under changing circumstances. As Creswell (2009) and others point out, qualitative researchers are interested in making sense of personal meanings and perspectives. Their goal is to interpret situations but they do not expect their findings to represent objective truth or to be

generalisable, except possibly by analogy. Analysis is often by thematic analysis and validity is judged in terms of such characteristics as trustworthiness, transferability, dependability and confirmability. A case study design is appropriate, according to Merriam (2001:35), “if you are interested in discovering the extent to which the treatment or program has been implemented.”

Participants

The study involved 32 school principals, deputies or department heads of primary, high, and special schools from a range of socio-economic contexts in the Western Cape province. Participants were selected (on the basis of their current and potential leadership roles) into a postgraduate qualification (Advanced Certificate in School Management and Leadership) that included in a module entitled, *Managing Teaching and Learning*, an introduction to cognitive education. The participants formed a small bounded system of experienced local school leaders motivated to develop professionally and who became interested in the active and intentional teaching of thinking. They were thus familiar with this term and had expressed interest in providing learners at their schools with skills and strategies for effective thinking (Collett & Green, 2017).

Data Collection

As part of their course each student completed an assignment that required them to explore the extent to which thinking was actively taught at their own schools and to identify the factors that either facilitated or constrained this process. They were instructed to interview two of their colleagues and submit their interview transcripts, together with a report drawing on their findings and on their own experience in order to address the following:

- Present strengths in the practices by you and your colleagues in teaching learners how to think;
- Present weaknesses in the practices by you and your colleagues in teaching learners how to think;
- Present levels of training you and your two colleagues have had in teaching learners how to think and how this has influenced your teaching;
- Strengths in your role and that of the School Management Team (SMT) and Heads of Departments (HODs) in your school in supporting teachers in teaching learners how to think;
- Weaknesses in your role and that of the SMT and HODs in your school supporting teachers in teaching learners how to think;
- Constraints in your school community and your classroom in teaching learners how to think deeply.

The data reported on in this article was sourced from copies of the 32 individual reports after they had been marked and returned to their authors.

Data Analysis

Data was thematically analysed according to the constant comparative method of grounded theory (Glaser & Strauss, 1967) although we did not

attempt to build a new theory. As Merriam (2001:159) points out, “[b]ecause the basic strategy of the constant comparative method is compatible with the inductive, concept building orientation of all qualitative research, the constant comparative method of data analysis has been adopted by many researchers who are not seeking to build substantive theory.” We acknowledge, however, that the themes we finally identified were inevitably influenced to some extent by our own backgrounds and expectations.

As this was a small study it was relatively easy to analyse the data without the aid of software such as AtlasTI. Each report was carefully perused on several occasions and responses relevant to each of the research questions were noted. A preliminary framework for analysis was created that could accommodate all the data. This framework of emerging themes and subthemes was modified several times before we arrived at a structure for each research question that captured the most frequently reported perceptions.

Categories were colour coded on the data sets according to the provisional themes that had been established. Each report was then checked for the presence or absence of each theme, which allowed us to calculate and compare the number of respondents who had raised each issue, expressed below as percentages. Units of meaning were considered themes worth reporting only if they were independently referred to by at least 10 individuals.

Data Verification

The credibility of the data is to an extent confirmed by its internal consistency and with the findings of other researchers such as Leithwood, Harris and Hopkins (2020), Louis, Dretzke and Wahlstrom (2010) and Maharajh, Nkosi and Mkhize (2016). The trustworthiness of individuals’ perceptions was partially confirmed by the seriousness with which they responded to the research task and the occasional checkable insights that they provided. Their perceptions do not represent the truth about the situation, but are useful because they suggest the way they and their colleagues are likely to define and respond to it. The trustworthiness (confirmability) of the data analysis relies on the audit trail created by the colour coding of units of meaning in the data.

Ethical Considerations

The study was conducted with the permission of the University of the Western Cape and followed the institution’s ethical guidelines. All participants were informed about the purposes of the research, assured of anonymity, and gave their written consent. Data were stored securely at the office or home of one of the researchers.

Research Findings and Discussion

Two illustrative quotations are included for each theme to allow readers to judge the essence of the theme. Where a theme contained different subthemes, additional quotations are provided to ensure that its scope is represented accurately. The frequency of each theme is indicated, however, by the percentage of participants who referred to it.

Research Question 1: What Cognitive Education Practices to Mediate Thinking are Currently Practiced in Participants' Schools?

Of the numerous references to practices perceived to address thinking, the most frequently mentioned themes were group work (53% of participants), the nurturing of thinking within the context of a particular learning area (50% of participants) and questioning (38% of participants).

Addressing thinking: Group work

Both Ms X and Mr Y are of the opinion that group work is important for the development of different thinking skills (22).

Group work seems to be the most popular practice [so] that learners can develop thinking skills (15).

Addressing thinking: Encouraging thinking in context

Over the years Ms X has used her subject as the vehicle to encourage critical and logical thinking (30).

Without explicitly setting out to develop critical thinking skills in learners, strategies to do so develop from the teaching of the content in their respective subject areas (1).

Addressing thinking: Questioning

Our educators ask unusual and challenging questions to the learners (14).

I continually encourage teachers to use questions as a means to illicit [sic] meaningful critical discussion and thinking in learners (24).

Group work can of course develop thinking if learners are guided to engage in dialogic enquiry but it was not clear whether teachers were aware of the importance of structuring group work. They seemed most confident of their ability to elicit thinking in the course of subject teaching, which they may indeed have done. What was missing, however, was any sense that learners' attention was drawn to thinking processes in order to develop metacognitive awareness, and any indication that learners were made aware of thinking tools that might have facilitated their thinking both in the classroom and beyond. Perkins stated 30 years ago, "We need to teach for better comprehension of core concepts in the subject matter, and we need to equip kids with the kinds of patterns of thinking – thinking organizers, if you like – that help them to manage their thinking and their learning" (Brandt, 1990:51–52). The third theme, questioning, is

certainly a strategy that can elicit thoughtful responses, although it depends on the type of question, and fear of ridicule may inhibit thought if the classroom climate is not supportive. All three practices reported were potentially positive but require further investigation.

Research Question 2: What Factors were Perceived to Facilitate the Active Mediation of Thinking in Participants' Schools?

Two themes were identified in the data, namely, CAPS assessment requirements (81% of participants) and institutional level support (69% of participants).

Facilitating factors: CAPS assessment requirements

At our school we very heavily rely on the curriculum when teaching our learners how to think ... teaching how to think is actually being done when the learners are doing their tests and assessments (18).

Ms X and Ms Y mention the use of Bloom's taxonomy when setting formal tasks and that this ensures that critical thinking is implemented (30).

SMT members or HODs are checking if the set paper is fair and set according to Bloom's taxonomy (7).

The CAPS requirement to apply Bloom's taxonomy when formulating assessment questions was a key element in our data and reflects the commendable efforts of the Department of Education to train teachers to assess not just facts, but the quality of learners' thinking. Participants reported that at their schools teachers followed the instructions provided and used verbs such as "analyse" and "compare" when formulating questions. Members of SMTs were well aware of their supervisory role and returned examination questions that were not satisfactory. No participant queried the assumption that setting challenging questions would be sufficient to elicit effective thinking. Challenging questions may motivate some learners but those learners who assume that school learning is about remembering facts, are likely to be at a loss. As teachers in the study recognised, experience of challenging questions is important, not just in examinations and tests, but regularly in the course of learning. They provide opportunities to draw attention to useful thinking strategies and generate ideas about other circumstances in which they might be helpful. Cognitive education, whatever form it takes (Green, 2014; Howie, D 2011), aims to empower learners to recognise and develop their own ability to think and provides a language in which to speak about, and take some control over, the invisible processes of their minds. While we found no evidence of formal whole-school initiatives to enhance thinking, the above practices do supply some hopeful signs.

Facilitating factors: Institutional level support

[We], the SMT are closely on the lookout whether the educators address or challenge the thinking skills of the learners (14).

Much time and finances are invested in support materials equipping our classrooms with the necessary learning and teaching support materials (18).

A strength that needs to be identified is the access to training that X High School allows.... Staff members are encouraged to attend training in any field of interest (30).

Institutional-level support tended not to focus directly on the teaching of thinking. Although there were a few exceptions, the general sense of the guidance and monitoring responses within this theme suggested that schools offered supervisory rather than collegial support. Support was often interpreted by participants as the kind of support that SMTs and HODs are normally expected to provide rather than support in the form of PLC's focused on the quality of teaching and learning and the active teaching of thinking. Other forms of support mentioned were the provision of resources and opportunities for training, which some schools were able to offer more generously than others. A few teachers had received training in some form of cognitive education but it was seldom claimed that this training currently informed their teaching. There was no reference made to emerging PLC's within or across schools.

Research Question 3: What Factors were Perceived to Constrain the Implementation of Cognitive Education?

The following four themes were identified in the data: institutional context (100% of participants), the CAPS curriculum (65% of participants), community context, (65% of participants) and teacher characteristics (59% of participants).

Constraining factors: Institutional context

This theme is illustrated by several quotations, not in order to reflect the quantity of responses, but to include examples of the range of challenges mentioned.

The other problem facing the school is that the only way to teach thinking skills effectively to learners is to ensure that it is nurtured within a thinking skills community (3).

A lack of resources also hinders teaching of thinking skills (5).

We have many learners that have barriers to learning (28).

At our school we are also challenged by teaching large classes (17).

The language barrier is one of the challenges (15).

One of the bad weaknesses is that some teachers do not come to school regularly (7).

We as educators do succumb to this pressure to perform in external matric examinations ...

Unfortunately a common weakness is that we sacrifice developing the higher order thinking

skills in order to achieve the results to pass the examination (24).

The above institutional conditions, at least one of which was mentioned in every participant's report, have been noted by other researchers (Maharajh et al., 2016). The data suggests that teaching is an enormous challenge in these schools. Most of the institutions involved in the study were stressed from within by unpredictable circumstances (for example gang violence and teacher absenteeism), and by limited resources, both human and material. Educating large classes, responding to high levels of language and learning support needs, as well as the various demands of education authorities contributed to increased workload demands. Stress might in part explain the fact that teacher absenteeism was noted as a problem.

Certain institutional limitations were particularly relevant to the introduction of cognitive education. Participants noted that schools did not have a clear and coherent overall plan to teach thinking, a fact that was attributed in part to a lack of knowledge and in part to the fact that curriculum planners did not specify that thinking should be actively taught. The message, both explicit and implicit, was that, unless the active teaching of thinking was, like Bloom's taxonomy, a departmental priority, it would not be taken seriously.

Certain desirable leadership qualities and responsibilities identified by Dempster (2009) require attention if PLC's are to be capacitated to develop teachers as thinkers and teachers of thinking. Our data suggests that teachers in this study understood their shared moral purpose to be meeting the requirements of the CAPS curriculum and ensuring learner achievement rather than developing themselves and their learners as thinkers and independent learners. Moreover, there was no evidence of negotiated norms for shared inquiry either in classrooms or among staff. Carpenter (2017) points out that in a PLC teachers need to do more than problem solve together about immediate practical matters. A PLC should engage with theory and be capable of respectful yet reasoned inquiry. There was no reference in the data to any form of structure to guide classroom or staffroom conversations. With regard to evidence-based planning and monitoring, the focus was on implementation of curriculum content, the attainment and analysis of systemic test results, and the correct use of Bloom's taxonomy when preparing assessment tasks. Active professional learning was, for the most part, encouraged but, despite policy, there was no reference to PLC's in schools. Most professional development activities took place by individual choice and not through ongoing collaborative activities within schools. The fact that teacher resistance was perceived as a salient constraining factor suggests the extent to

which many school communities could not yet describe themselves as active and supportive PLC's.

Dempster (2009) also refers to enhancing the conditions for learning, which is a basic aspect of the task of any school leader. Our findings indicate that leadership did play a key role in supporting teachers with resources for teaching, as well as addressing a range of organisational conditions to enable them to teach. Issues of discipline and safety were salient in some schools. There was little evidence of a culture and structures in the schools that would enable teachers to share their practice in a collaborative way or to work as PLC's. Although staff did meet in subject or other collaborative groups, the emphasis often appeared to be on crisis management and the attainment of specific curriculum goals. Very little time was allocated to systematic reflection on practice. Enquiry into teaching and learning practices was primarily driven by pressure from outside the school via district staff who required schools to engage with systemic test results. With regard to distributed leadership, there was little evidence of teachers taking or being given leadership to engage in deep inquiry into their teaching or learner learning through action research or structured inquiry.

Constraining factors: The CAPS curriculum

There is too much content that must be taught and therefore time for encouraging thinking is quite limited (22).

There is no coherent strategy to teach critical thinking skills as a core fundamental of the curriculum. This lack of overall strategy can be laid at the door of those who design the curriculum ... There is nothing mentioned in the IQMS [Integrated Quality Management System] when educators are being evaluated. (28)

CAPS was perceived to constrain as well as facilitate the teaching of thinking. Criticism of the quantity and pace of the CAPS curriculum are not new. Teachers in South Africa have for the past 20 years experienced many curriculum and other changes and, as other authors have noted (Bantwini & King-McKenzie, 2011; Christie, 1998; Msila, 2016), tend to resist new initiatives. Therefore, it is not surprising that many teachers resist the introduction of any practices that are perceived to add to their workload.

Professional communities of practice, although now mandated by policy (DBE, RSA, 2015) cannot develop in schools unless this activity is perceived as a priority by school leaders and assigned sufficient time for teachers to engage in professional learning together (Carpenter, 2017). In addition, if cognitive education practices were to be introduced in schools their success would depend on teachers' genuine belief in their value, as well as opportunities for them to develop as competent teachers of thinking.

Constraining factors: Community context

Parental support is very poor at our school (17).

Our school is situated in a disadvantageous [sic] community. Children we are teaching come from dysfunctional families (15).

The school is set in socio-economic conditions of gang violence and poverty ... Gang related violence is often experienced at the school (24).

The contexts of several schools had a direct influence on teachers' and leaders' ability to focus on pedagogy. Time and attention to focus on enhancing critical and creative thinking was limited. Participants in this study indicated that support for learning from external providers or from parents/guardians was minimal. The surrounding conditions of poverty and violence increased the pressures that teachers and leadership were under and took time and support away from a focus on teaching and learning.

Constraining factors: Teacher characteristics

... the biggest challenge we will face at X school is a possible unresponsive and sceptical target audience (3).

Educators' poor understanding of the concept [cognitive education] is a major obstacle to teaching thinking (20).

As HOD I am supposed to support my staff but this role is lacking as I know nothing about teaching of thinking (21).

The quotations above illustrate two dimensions of teacher resistance, firstly, a state of mind created and sustained by a series of new curriculum initiatives since the mid 1990s. Secondly, teachers tend to be suspicious of new initiatives, possibly because their sense of professional competence has been undermined and, as our data illustrates, the intentional teaching of thinking was an unfamiliar concept to many teachers, some of whom were in senior positions.

Most teachers and school leaders were apparently unfamiliar with notions of learned intelligence, confused by the terminology associated with teaching thinking and lacking in relevant teaching skills. In some cases, the perception was that teachers themselves lacked thinking skills, a situation that, if true, might be addressed by leadership's introduction of PLC's, as specified by policy. Learning about their own thinking processes would be a sound foundation upon which to build skills to develop those of their learners (Kozulin, 2015) and, if well mediated, could generate the necessary motivation to do so. Building on what teachers already know about Bloom's taxonomy may well be an appropriate starting point for inquiry in these PLC's.

Conditions in many of the schools in our study were far from conducive to effective teaching and learning but the establishment of PLC's, as specified by policy, offers an opportunity to develop teachers as thinkers and teachers of

thinking. We suggest, therefore, that leadership in schools could fruitfully focus on:

- Promoting the culture and structures, including institutionalised time, that allow PLC's to flourish;
- Establishing within PLC's a clear vision of the relationship between cognitive education and the mastery of critical and creative thinking skills;
- Developing within PLC's a shared knowledge and evidence base for the practice of cognitive education;
- Investigating existing subject embedded cognitive education practices;
- Developing teacher and learner inquiry skills;
- Consultative planning for the active teaching of thinking and any necessary staff coaching;
- Exploring ways of sharing leadership responsibilities for cognitive education.

Conclusion

We acknowledge that the trends and patterns identified in this study may not be applicable to other contexts, as they represent the interpretations of these participants, reinterpreted by ourselves. However, our findings point to a possible direction for South African school leaders that may be relevant in other school contexts.

They highlight a need to strengthen a focus on thinking about thinking in classrooms and staffrooms. A starting point for deeper thinking and inquiry could be to build on the shared capacity and understanding that teachers already have as a result of their use of Bloom's and other taxonomies in reviewing and monitoring assessment activities.

There is theoretical and empirical support for the belief that it is possible to equip learners with the skills that promote critical and creative thinking. Well-functioning PLC's in schools would be an ideal environment in which to introduce cognitive education as a source of personal and professional growth for teachers, as well as a means of developing learners as thinkers.

Structural inequalities and socio-economic difficulties still play a significant role in South African education after 25 years of democracy. Although there are still numerous challenges to be addressed in the education system, we believe that it is possible to take small steps towards developing learners and teachers as critical and creative thinkers as specified by CAPS, on condition that organisational and system level support, resources and time are allocated for teacher reflection and inquiry in PLC's.

We, therefore, urge school leaders and departmental authorities to grasp the opportunity to build on teachers' emerging understandings of Bloom's taxonomy within the context of effective teacher PLC's so that teachers become better able to prepare, not only challenging questions that require thinking, but also learners who know how to answer them.

Authors' Contributions

Karen Collett designed the student task and reviewed the school leadership literature. Lena Green reviewed the cognitive education literature. The authors collaborated regarding the data analysis and discussion and Lena Green wrote the final version.

Notes

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