

Intermediate and Senior Phase Mathematics Teachers' Perceptions of Curriculum Advisors

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Abstract

Not much is known officially about the ways in which mathematics teachers experience their relationship with the curriculum advisor. This descriptive study investigated, by survey, the views and experiences of a convenient sample of intermediate and senior phase mathematics (grades 4-9) teachers with respect to the curriculum advisory services at schools in the Western Cape, South Africa. The results indicate that these teachers considered the role and job description of the curriculum advisor to be mainly centred on their immediate teaching needs. Consequently, they were unsure about mathematics curriculum-related expectations. Results also indicate a distant relationship with the curriculum advisor with minimal interaction and communication. The majority of teachers reported never having had experiences of their lessons being observed by the mathematics CA, though many respondents still expressed a desire for receiving specialised support from the CA. The findings of this study may be used proactively to inform the planning and design of any future curriculum advisory provision directorates or inspectorates.

Keywords: curriculum advisor; teacher support; mathematics teach and learning

1. Introduction

The concern with the poor state of mathematics in South Africa is widely reported and researched (e.g. Bernstein, Clynick & Lee, 2004; HSRC, 1996). Both internal and international evaluations have indicated that the mathematics skills of South African learners can at best be described as very unsatisfactory. This situation exists across all phases of formal learning. For example, the South African Department of Education (DoE) has had periodic systemic evaluations since 2001. In 2001, grade 3 learners achieved an average of 30% in numeracy (mathematics in the foundation phase) and in 2004, grade 6 learners achieved an average of 27% in Mathematics (DoE, 2003a; 2005). Additionally, in the 2009 Annual National Assessment (ANA) conducted by the DoE the percentage of learners achieving more than 50 % in grades one to six were respectively: 63%, 66%, 43%, 28%, 22% and 23% (DoE, 2010). Although there has been much improvement in the matriculation examination pass rates over the years, these may not be good indicators of the quality of education (Rosenberg, Nsubuga & Burt, 2009). In 2011, only 21% of matriculants that wrote mathematics achieved more than 30% (DoE, 2011) highlighting what some may consider to be a crisis in mathematics education.

South African learners' mathematics skills have been measured against their international counterparts in a number of evaluations. In the second Southern African Consortium for Monitoring Educational Quality (SACMEQ II) Project, conducted between 2000 and 2002, the mathematics achievement levels of South African learners were found to be poor, achieving just below the SACMEQ mean score and ranking ninth out of 14 participating countries (DoE, 2008). Previous studies by the Human Sciences Research Council (1996) and the Trends in the International Mathematics and Science Study TIMMS-R (1999) found that that South African learners fared very poorly in mathematics compared to other developing countries. In the latter study, there were no sections of mathematics in which South African learners performed well; their problem-solving skills were inadequate; and classroom contact time with teachers was less than in other countries who out-performed South Africa.

Bernstein et al (2004, p. 6) report that within South Africa, education experts, practitioners, parents and learners contend that "maths [and science] is the component of the education system that needs to be reformed most urgently". According to Chisholm (2004) there is a body of evidence suggesting a poor standard of primary school education in the majority of schools. Although many reasons can be sighted for the poor state of affairs in primary education, an important one is teachers with poor knowledge of both content and subject pedagogy (DoE, 2007; NPC, 2011). Since we concur with the views of Chisholm, and also considering the 2011 ANA results in mathematics, we decided to look at primary school mathematics education with a focus on the support that grades 4-9 (intermediate and senior phase [ISP]) mathematics teachers received from mathematics curriculum advisors. Since CA's are mostly located at the education district offices, they are part of the education supervisory, support and monitoring system of teachers and schools (DoE, 2003), previously described as school inspectorate services, which is briefly discussed below.

A well-functioning Schools Inspectorate is one of the instruments to determine and promote good education (Ehren & Visscher, 2006). In the case of South Africa currently, this body would be the School Advisory Service. The use of school inspection in an effort to improve the quality of education in general is an issue of public debate in South Africa (DoE, 2009a) This debate is, however, not unique to South Africa. According to London (2004,) nationally and internationally, the conceptualization of school inspection over the years, has undergone radical changes. In many instances this change has been linked to political and/or ideological forces operative within the public domain. London (2004, p.479) reports on the "intense professional and public debate in several countries", while the South African Government recently announced their intention to change to a school monitoring system similar to what was in place prior to 1994 (DoE, 2009a). It is proposed that the new monitoring system be managed by an autonomous body named the "National Education Evaluation and Development Unit (NEEDU)".

Research over the past 15 years has reported extensively on the positive effects of academic leadership in implementing academic programmes and improving academic prowess in schools internationally (Bushher & Harris, 1999; Kaur, Ferrucci & Carter, 2004; & London, 2004). In this article the spotlight is on the academic leadership role of the subject advisor as mentor of mathematics teachers in implementing the National Curriculum Statement (DoE, 2003). The authors examined the effects of this intervention on mathematics achievement as experienced by some of these teachers in the Western Cape, a province of South Africa. It seems that research on the role of the curriculum advisor as the initiator of change and facilitator of improved mathematics teaching and learning in terms of the ISP - grades four to nine, is non-existent within the South African context. No studies could be found relating to the role of the mathematics curriculum advisor in this phase of schooling. The only related South African study found, focussed on the role of the curriculum advisor in the subject, Natural Sciences (Dilotothle, Smit & Vreken, 2001).

Anecdotal evidence such as the views expressed by individual mathematics teachers to the authors as well as the authors' own experiences in interactions with schools suggests that mathematics teachers seem to be unclear about what the actual role of the curriculum advisor was. Furthermore, the authors' experiences with mathematics teachers over the years indicate that the role of the mathematics curriculum advisor is questioned by teachers. Many teachers feel that the number of CA's in the field is inadequate to have a meaningful impact or to make a significant difference in the teaching of mathematics. Thus the mentoring, support and facilitation roles of the subject advisor in mathematics education as it currently exists, are often questioned by mathematics teachers. Consequently, this paper is geared towards establishing what the views and experiences of ISP mathematics teachers in their encounters with mathematics CA's in schools in the Western Cape are.

To date, we have only found one instance where the different role-players in education, other than education officials were consulted widely on the many challenges facing South African education, including the poor performance in mathematics thus far (DoE, 2009b) The authors therefore felt this would be an opportune time to investigate teachers' perceptions of their relationships and encounters with their curriculum (subject) advisor, and to use the information and findings to make informed decisions regarding future plans as far as curriculum advisory services are concerned. The question that the authors wanted answered pertained to how teachers perceived the current state of affairs with respect to the support they experienced from mathematics curriculum advisors.

2. Literature Review

The literature studied deals with specific issues considered crucial in the realm of external supervision of schools by CA's, both nationally and internationally, with special emphasis on teachers' experiences. Some of these issues include the approach to management (and related issues); the main focus of the CA; teachers' perceptions regarding the role of the CA; the general expectations that teachers have of the CA; and reciprocity as the main component of the CA-mathematics teacher relationship.

From interactions with mathematics teachers and from perspectives and findings reported in previous research (Chapman, 2001; Dilotsohle, Smit & Vreken, 2001; London, 2004), it is evident that the practice of school inspectorates or school advisory services is, to a large extent, top-down in its implementation and management. Ehren and Visscher (2006, p. 51), however, speak of a dichotomy of inspection strategies, being either directive or in-directive. They claim that the directive approach appears to be more suitable for underperforming schools. This, in a sense, validates the top-down approach, since it involves education authorities categorising the school and deciding on the appropriate interventions independently. The management role (Crawford & Earley, 2004; Ehren & Visscher, 2008; Leeuw, 2002) of the school inspector or curriculum advisor is seen as an essential part of the teaching establishment, and as such, teachers have to accept and live with it. This position is supported by Chapman (2001, p. 60) who states "that the teacher must be willing to listen to the suggestions and implement the recommendations". The top-down approach is also emphasised by Dilotsohle, Smit and Vreken (2001), who maintain that this approach is largely about compliance with departmental regulations rather than engaging with educators about their work. Their research findings highlight that the focus of the curriculum advisory service (CAS) is on management rather than on curriculum issues related to subject content, teaching or learning. The focus of the CAS in South Africa has always been a controversial one. Although the CAS is currently geared towards catering for the whole schooling system, special attention is given to Grade 12 to ensure better results nationally. Dilotsohle, Smit and Vreken (2001, p. 306) describe this approach as "oriented towards the narrow objective of improving Grade 12 examination results". Apart from focussing on particular grades only, inspections or school monitoring by CA's is also geared towards other curricular aspects as discussed above.

Teachers have particular expectations regarding the role of the CA. Dilotsohle, Smit and Vreken (2001) listed a number of teacher expectations considered as pivotal. They expect the CA to: give advice and guidance with respect to the subject, be evaluated, receive encouragement, acknowledge high-quality work, and to receive relevant information. They also expect the CA to perform the role of facilitator, and to implement policy and programmes. An important aspect having a bearing on the CA-teacher relationship is the ability of school inspectors (CA's) to recognise the practical dilemmas facing teachers since these generate the school circumstances which inspectors face during an inspection (Silcock & Wyness, 1998).

The views of teachers, as well as their responses to inspections world-wide, show similarities. Chapman (2001) is of the view that fear, stress and associated negative perceptions towards the process of inspection are quite common. He further highlights the fact that the period prior to inspection usually increases teachers' anxiety and stress levels remarkably. This view is shared by Ehren and Visscher (2006) who state that school inspections often bring about unintended negative effects such as stress, school staff being faced with higher workloads, window dressing and reluctance towards innovation because of the fear of being in conflict with the school inspection criteria. In South Africa, since the early nineties, the main emphasis of school inspections has been on advising as opposed to criticising teaching, meaning that the CA "was not to be seen as an inspector" (Dilotsohle, Smit & Vreken, 2001, p. 305). Similarly, in Trinidad and Tobago, the preferred descriptive term for such a service after independence was school supervision rather than school inspection (London 2004) since this service was orientated towards collegiality and transparency in approach, as well as generating increasing confidence in teachers.

The element of reciprocity seems to be viewed as an essential feature inherent to any teacher-CA relationship. In this regard the teacher must be a willing participant since reciprocity essentially entails "the ratio of giving and receiving support within a certain period of time" (Leeuw 2002, p. 137). Reciprocity also relates to "the balance between "evaluability ... that inspectorates request" from schools versus the "evaluability" of the DoE and the work done by the CA. This characteristic seems to have been largely ignored in the South African context. However, the DoE commissioned a review of the implementation of the National Curriculum Statement in 2009 (DoE, 2009b). This review was conducted nationally and included the views of teachers country-wide on a host of issues related to the delivery of the curriculum. Teachers were also asked to share their views about curriculum advisors in general. Many teachers described the current role of the CA as primarily being technician, with the focus on demanding unnecessary administrative tasks and 'box ticking' by teachers. The review also showed that there were too few CA's to give meaningful support to teachers. The knowledge and skills of many of the CA's were also questioned by teachers (Dada, Dipholo, Hoadley, Khembo, Muller & Volmink, 2010). A brief elaboration of the official role and position of the curriculum advisor as prescribed in the Education Labour Relations Council's (ELRC) Policy Handbook for Educators (ELRC, 2003) follows.

The ELRC's Policy Handbook for Educators (PHE) (DoE, 2003) details the roles and expectations required of CA's. It must be noted though, that the handbook provides a generic guide concerning the functions of CA's and therefore does not specify expectations for different subject specialisations including mathematics. The PHE considers curriculum delivery to be the "core process" that defines the role of the curriculum advisor. Curriculum delivery according to this source centres on "guidance and counselling", "monitoring" and "recording [of] progress" and "curriculum development". It

is stressed that curriculum advisors should be constantly aware of their role in education to enhance transformation, redress and equity. As such, the curriculum advisor's prime function is to "facilitate curriculum delivery through support in various ways" (DoE, 2003). Some of these core responsibilities relate to leadership, communication, financial planning and management, strategic planning, research and development, curriculum delivery, policy, curriculum development and staff development. Since some of these factors have a bearing on this study, they are briefly outlined below.

Leadership by curriculum advisors, according to the PHE, includes the creation of an environment that creates and fosters commitment and confidence among colleagues and teachers, while promoting the values of fairness and equity in the workplace. Furthermore, CA's need to provide professional leadership by assisting teachers in identifying, assessing and meeting the needs of learners. In this manner, they encourage the application and dissemination of good practices in all areas of work (ELRC, 2003). Some of the salient aspects regarding communication stated in the PHE are the following: to communicate effectively with principals, other staff, parents and school governing bodies (SGBs), to ensure timely feedback from institutions, to consult with all stakeholders on decisions that affect them, to explain the objectives of any intervention/s to learners, teachers and others, and to chair workshops, case conferences and meetings when needed (DoE, 2003b). Core curriculum advisor duties that had a bearing on curriculum delivery including the deployment of staff and resources to facilitate teaching and learning, providing guidance and counselling to learners on request, partnering with schools and parents to enhance teaching and learning, developing systems of monitoring and recording the progress made towards the achievement of learner progress targets, facilitating curriculum development, providing guidance in assessments and promoting national education campaigns.

3. Conceptual Framework

As stated, the core responsibilities of the CA as *office-based educator* (as defined in the PHE) centre on leadership, communication, management, transformation, research and development, and curriculum delivery. Theories that inform these tasks and that relate to this study would assist us as researchers in making informed judgements regarding the scope of teachers' knowledge of and perceptions relating to the role and effectiveness of the curriculum advisor. We therefore consider facilitation theory and path-goal leadership (PGL) theory to be relevant to this study. A brief discussion of each theory follows. This is not meant to be an in-depth and critical analysis of each of theory but rather, the aim is to highlight critical aspects of each that inform or have a bearing on this study.

According to Laird (1985, cited in Dunn, 2002) facilitation theory is based on the premise that learning will occur by the educator (represented by the curriculum advisor in this study) acting as a facilitator. In this manner an atmosphere is established in which learners (in this case, teachers as adult learners) feel comfortable to consider new ideas and are not threatened by external factors. Burns (1995, p. 268) makes a similar point when he says that "[f]acilitative teaching involves creating the conditions under which learning [and growth] can occur without seeking to control the outcome". Broomefield adds the important aspect of using learners' contributions: "Good adult teaching is generally seen as the ability to set a certain emotional climate, to use learners' experiences as educational resources, to provide plenty of evaluative information ... and to encourage collaboration and participation" (1986, p. 135). Other important assumptions of facilitation theory are that "humans have an inborn eagerness to learn, and that the most significant learning involves changing one's concept of oneself" (Dunn, 2002, p. 2).

Broomefield (1986, p. 123) maintains that facilitators who work with adults, should not merely direct, but that the emphasis should be on providing assistance towards attaining a state of "self-actualization or to become fully functioning persons". Burns (1995, p. 268) emphasises the facilitative teacher's awareness of the learners' "capacities, needs and past experience" and the ability to use this information to "create a learning situation in which adult learners can meet their needs or solve a problem in an autonomous and independent way". According to Dunn (2002, p. 2) facilitative teachers are "less protective of their [own] constructs and beliefs"; they show a tendency to be able to listen to learners more often, especially to their feelings; they are "inclined to pay as much attention to their relationship with learners as to the content of the course"; and they "are apt to accept feedback, both positive and negative and to use it as constructive insight into themselves and their behaviour".

Path-goal theory (PGL) is mainly concerned with leadership. This theory emphasizes that the effectiveness of leaders is dependent on the extent to which they provide support by clarifying any work-related issues amongst their subordinates, and providing the support and resources required to attain work goals. PGL is also concerned with the day-to-day relationships between supervisors and their subordinates, specifically how supervisors affect the motivation and satisfaction levels of their subordinates. PGL emphasises the role of the followers as well as the "contextual nature of leadership" (Bolden, Gosling, Marturano & Dennison, 2003, p. 6). Given the current organisational and governance style of the Department of Education, school-based personnel usually respond to the requirements and expectations provided

by district officials in terms of a close implementation of policy. Therefore, the style of leadership described under the PGL theory that may relate most closely to the way the subject advisory services currently operates, is a directive leadership style, as opposed to supportive, participative or achievement-oriented styles (House & Mitchell, 1974). It implies that as a norm, followers are informed or instructed on what to do, what strategies to follow or what outcomes need to be achieved. This may also involve being given specific work schedules or plans to follow and to complete over a particular period of time. This approach to leadership assumes that there is only one particular way of achieving the outcome, which is only clear or visible to the leader. This portrays the manager as the "knowing person and the follower as the dependent" (House, 1971, p. 321).

Facilitation theory therefore emphasizes the need for the facilitator to create an emotional climate that supports learner (teachers in this instance) participation, including learners sharing their own experiences during the learning process. It also emphasizes collaboration and the building of relationships between the facilitator (CA) and the learners, as well as an openness by the facilitator to receiving feedback from learners including constructive criticism. Path-goal theory complements facilitation theory because it emphasizes the need for the supervisor to consider the satisfaction and motivation levels of their subordinates by providing direction, support and resources. These theories were identified to be closely linked to the mentoring, facilitating and managing (leadership) roles of the CA. As such there appears to be a need to explore the relevance and links of each of these roles and to highlight how they may influence the job description of the subject advisor. This may have implications for how the role of the curriculum is viewed by mathematics teachers.

4. Research Design and Methodology

The education system in South Africa seems to be in continual flux and crisis (Stokes, 2009; & Bloch, 2006). Not only is outcomes-based education being blamed for the unsatisfactory state of national education but the functions and effectiveness of the CA's are under scrutiny and are being questioned. These trends led the researchers to explore the curriculum advisor as an influential role-player in curriculum delivery (Stokes, 2009). Consequently, the primary aim of this research dealt with how mathematics teachers perceive the role of the mathematics curriculum advisor and to what extent their educational needs were being met.

This is a descriptive study directed at investigating the views and experiences of intermediate and senior phase mathematics teachers regarding the role of the curriculum advisors as curriculum support workers in the Western Cape. The research was based on a survey, yielding both quantitative and qualitative data. Using quantitative as well as qualitative data is an effective way to improve the construct validity (De Vos, Strydom, Fouché & Delport, 2011). The study entailed a literature review to obtain a holistic picture of the extent and nature of the role and position of the curriculum advisor as an official link between the DoE (at district, provincial and national level) and the teachers in the field. A written request for permission to perform the research was forwarded to the Director of Research at the Western Cape Education Department (WCED). Permission was subsequently granted to involve intermediate and senior phase mathematics teachers.

In addition to the literature study, questionnaires were developed and manually distributed to primary school mathematics teachers from the different school districts within the Western Cape. This province is divided geographically into eight school districts. The questionnaires were personally handed to a convenient sample of intermediate and senior phase mathematics teachers by visiting various schools. The relevant population of teachers at DoE training sessions were also approached to participate in the study. In an effort to ensure more elaborate and comprehensive responses, respondents were allowed to complete the questionnaires at their own pace and in their own time. The completed questionnaires were either collected or returned at specific venues, which ensured a higher return rate. In order to increase validity and representativeness an effort was made to include teachers from as many different school districts as possible.

The questionnaire was initially peer reviewed by colleagues at the University Educational Faculty where the authors are employed. It was then piloted with a few ISP teachers and revisions were made. The final questionnaire consisted of 14 questions, some with sub-questions. The majority of questions were open-ended allowing respondents to share their own views and perceptions in their own words. Consequently, respondents had more freedom about how they answered questions as opposed to "fixed-alternative and scaled items" (Mitchell & Jolley, 1992, p. 466). Open-ended questions are useful as an exploratory device because they allow unexpected, but important, responses (De Vos et al, 2011). This questioning format also allowed the researchers to gauge how knowledgeable the respondents were about the survey topic. The questionnaires were collected manually a day after distribution. In total, 70 questionnaires were distributed to mathematics ISP teachers and 58 were returned, which amounted to a response rate of about 83%. The questions in the questionnaire that generated quantitative data dealt with the number of school visits by the curriculum

advisor, the frequency of telephonic discussions, and the number of verbal communication incidences with curriculum advisors. Data collected by means of the questionnaires were analysed, interpreted, categorised and described. Limitations in terms of the data generating methods related to: (i) the use of convenient sampling, thus the findings may not adequately represent the views of the population of Western Cape ISP mathematics teachers, (ii) the number of respondents who could be reached because of time and logistical factors such as distance; respondents' honest reporting; and (iii) respondents' insight and knowledge regarding the topic.

5. Discussion of Results

The data that emerged from the survey that was conducted among the intermediate and senior phase mathematics teachers in the Western Cape are discussed in this section. Questionnaires that were returned without any responses were not included for purposes of analysis. The education districts in the Western Cape where the respondents' schools are situated are indicated in Table 1.

Table 1: Western Cape School district distribution

School district	Number of respondents
Cape Winelands	10
Eden and Karoo	02
Metro Central	03
Metro East	11
Metro North	10
Metro South	08
West Coast	04
Not indicated	10
Total	58

Due to logistical and monetary constraints, random sampling was not possible. Also, there was no explicit indication of teachers representing one of the education districts, namely Breederivier/Overberg. However, it is possible that this district may have been represented by one or more of the ten respondents who did not indicate the name of the district where their schools are situated.

The responses relating to how teachers perceived the official role of the mathematics subject advisor were sketchy and only a few of the responses elaborated on what respondents saw as the official role of the CA. The sketchy responses may have also echoed the findings in the 2009 Task Team Review Report on the implementation of the National Curriculum Statement (DoE, 2009b). The report mentions that there exists a "pervasive sense of reform fatigue amongst South African teachers" (DOE, 2009b, p. 46) due to the continual change taking place in education. Teachers reported that the frequent change in education caused feelings of being overwhelmed, resulting in apathy and resentment amongst many teachers (DoE, 2009b). The 2009 report also mentions that the roles of curriculum advisors need clarification. Perhaps more meaningful information would have been elicited, had interviews or focus group discussions been used. In order to arrange data meaningfully, the key responsibilities of the CA as perceived by teachers are indicated in Table 2.

The key responsibilities are embodied in those concepts that the respondents used to define the meaning of the CA's role as a curriculum worker. The focus column contains those aspects that respondents used, to assign meaning to the key responsibilities. The purpose for quantifying the frequencies of key responsibilities helped to arrange the responses in terms of the teachers' rating of what they viewed as the significant aspects related to the role of the CA.

Table 2: Mathematics teachers' perceptions of the core duties of CA's

Key responsibilities	Frequency	%	The focus of the CA, according to teachers, should be on:
Advise	15	10	new developments; achieving learning outcomes in mathematics; everything related to the mathematics curriculum
Help/assist/support	34	23	identifying knowledge and teaching gaps; helping to achieve outcomes; improving mathematics; developing resources, teaching materials and new teaching techniques; eliminating obstacles related to teaching
Inform/explain/interpret/ implement	19	13	new knowledge, information and developments; curriculum matters; sharing expectations; clearing up confusion

Develop/standardise	3	2	presentation and planning (lessons and work schedules)
Empower	11	7	setting reasonable targets; setting standards; keeping teachers abreast of changes
Workshop	10	7	arranging workshops, cluster meetings & information sessions
Provide guidance	21	14	providing information to improve teaching and broaden content
Monitor/check/moderate	33	22	maintaining standards among schools; ensuring that teachers stay on track; implementing the process of planning; conducting more regular school visits
Mentor	3	2	teachers new to the profession in particular

The way in which respondents viewed the role of the CA seemed to relate to their immediate needs with respect to the learning and teaching of mathematics. According to the respondents, some of the most frequently applied characteristics of a CA were to advise, assist, and support with respect to a variety of issues. The most common aspects that were identified are: giving advice with new developments, helping to achieve learning outcomes in mathematics, assisting with curriculum matters, identifying and addressing knowledge and teaching gaps, providing help to achieve outcomes, improving mathematics teaching and learning, providing leadership and guidance with utilisation of resources, and developing teaching materials, and new teaching techniques. They also emphasised the informing, explaining and interpreting aspects of the CA's role. Quite a few respondents emphasised the 'policing' role of the CA, because they saw him/her as someone who merely checks and finds fault instead of adopting a facilitating role. There seemed to be a need among the respondents, based on the survey, to receive training, especially in the broadening of their content knowledge. The key responsibilities of the CA that were identified by the teachers resonate with the mentoring, facilitating and managing roles of the CA which are also inherent to facilitation and PGL theories – the conceptual framework of the study.

Many of the responses related to improving teaching competencies, suggesting the need for workshops. However, diverse views were expressed about how the workshops should be organised. Some respondents preferred school cluster workshops – usually in terms of geographical location or clustering. Other respondents preferred need-specific workshops, identified through needs analysis of individual mathematics teachers, either by the school's senior management team (SMT), the individual teacher's Head of Department (HOD) or the CA. Another group of respondents preferred workshops to be geared towards addressing specific challenges facing individual schools. The latter suggestion related to respondents' expressed need for the CA to provide guidance and support regarding contextual factors pertaining to a specific school or circuit. Mestry, Hendricks and Bisschoff (2009, p. 488) highlight the importance of central planning of teacher development programs, but with the involvement of schools because of the diverse needs of individual teachers. They therefore advocate a coherent and integrated professional development plan that is based on the school's vision for learner success. Many of the respondents also expected the CA to be competent and to be abreast of the latest developments in mathematics education. These sentiments were also evident in the 2009 review report on the implementation of the NCS. The same report also highlighted teachers' preferences for a needs-driven training, informed by prior classroom observation, and which targeted both official curriculum requirements and the challenges/needs of teachers (DoE, 2009b).

Frequency of communication of the mathematics teacher with the CA related to face-to-face encounters, telephonic discussions, e-mail correspondence or other means of communication incidences. The contact sessions referred to in this question were those initiated by the mathematics teachers themselves over the past year and might point to the type of relationship that exists with the CA. These are reflected in Table 3 which consists of rows indicating the means of communication, and columns reflecting the frequency of communication which was measured by a scale of zero (0) to 4+ times. Zero represented no communication with the CA with regard to a particular means of communication.

Table 3: Frequencies of communication types between math teachers and CA's

Type of communication	Frequency per year				
	0	1	2	3	4 +
Face-to-face	16	17	19	1	5
Telephonic	47	3	6	1	1
E-mail	50	1	5	0	2
Other (workshops/via HOD/cluster groups)	52	3	1	2	0

It is evident from the data in Table 3 that the contact initiated by teachers with the CA was low. Taking into account the

communication technology (such as telephones and e-mail) the reason for the lack of communication may either have something to do with the availability of the CA or the quality of educational relationship that exists between teacher and CA, given issues highlighted in the 2009 review report such lack of clarity of the roles that CA's play, the lack of confidence by some teachers in the ability of the CA's to provide adequate support and the constant change in education leading to teacher fatigue and apathy (DoE, 2009b).

In contrast to the contact initiated by the mathematics teachers themselves, Table 4 relates to the frequency of official visits to schools by CA's on formal curriculum issues. Respondents had to indicate the number of times they were visited by the CA in the past four years.

Table 4: Official visits by the curriculum advisor

Number of visits in past 4 years	Frequency of visits
Never	27
Once	8
Twice	6
Thrice	5
Four times or more	12

Similar to teacher-initiated communications, the visitation frequency by CA's over the past four years was quite low, which is probably linked to the fact that currently there are altogether only 10 mathematics ISP CA's servicing the ISP teachers across the Western Cape province of 1458 mainstream schools. Six of the eight education districts has one mathematics curriculum advisor each, with the remaining two districts having two advisors each. This means that each mathematics ISP CA on average has to serve approximately 146 mainstream (non-special) schools. However, different districts do provide services unique to their contexts and may include the support of further education and training (grades 10 -12) mathematics curriculum advisors in assisting the ISP advisors (Cameron [Director of Curriculum Development, WCED], 2010:e-mail). This does not take into account the 71 special schools or the 87 independent schools in the province (Western Cape Education Department, Media release, 17 July 2007). This scenario suggests that the number of ISP mathematics curriculum advisors are inadequate in giving ISP mathematics teachers sustained and meaningful support and is consistent with the 2009 review report's findings (DoE, 2009b).

Respondents were asked to state when last they had had a subject-related conversation with the CA, discussing how, what or when to teach particular content. The majority of respondents, about 88%, answered in the negative. This meant that over the span of their teaching career as mathematics teachers, they had never had a face-to-face discussion with their CA on didactical matters. Only 12 % of respondents indicated that they had had subject-related conversations at a workshop without indicating the frequency thereof.

Regarding the question as to whether there was a need to enter into such (didactical) discussions with the CA, about 17% of the respondents replied in the negative, while the overwhelming majority of the respondents (about 83%) were of the opinion that such a need did exist. Some of the reasons for not seeing the need for CA-teacher discussions are quoted below:

- *The WCED sent out regular circulars to announce changes.*
- *They only come when you ask them questions, you never get guidance during the year and when they look they see thousands of mistakes.*

Those teachers who did not see the need for interactions with the CA may share similar sentiments of many teachers, who see the CA as a technician focussing on getting teachers to do ever increasing administrative tasks rather than focussing on supporting curriculum delivery (DoE, 2009b). Those who seek face-to-face interaction with the CA offer reasons that relate to classroom practice generally, and the emphasis seems to be on the improvement of teaching methods, coping with and adapting to change, managing barriers to learning, and being assured of being on the right track as far as curriculum is concerned. Some of the reasons given were:

- *Yes, I struggle to get learners to master certain skills, for example mental maths, word problems and to work with common fractions.*
- *Yes, any teacher can excel if they are aware of the latest teaching methods, resources and interventions.*
- *Yes, because of all the changes; yes, new techniques are introduced every year, and one can be blamed for not wanting to adapt or change.*
- *Certainly, that would help us to stay on the right track, and to develop better learners.*

The question on lesson observation enquired whether the CA had observed any lessons taught by the respondents in the

last three years. If not, respondents were requested to provide reasons as to why they thought this was the case. The majority of the responses (83%) indicated that the CA had not observed any lessons being taught over the past three years. Some of the reasons offered were:

- No, maybe because of his busy programme.
- No, I would like to see it happen – did not experience it yet.
- No, he does not have the time – but he needs to issue a notice requesting permission to observe.
- No, I am not open to such lessons, if my CA does not visit me first to inform me about his expectations.
- No, possibly because they don't get time since they are constantly moving from school to school;
- No ... the protocol doesn't allow them.
- No ... teachers must grant permission.

From the responses above it seems as if teachers perceive the CA to have limited access to the classrooms of public schools, and that they as teachers have the right to refuse CA's access to their classrooms. These responses may relate to the 2009 review report finding that highlights the role of teacher unions in encouraging teachers to refuse classroom visits by education officials including CA's (DoE, 2009b). It might be concluded that in such cases no real monitoring or intervention can occur.

6. Conclusion

The aim of this research was to investigate how intermediate and senior phase mathematics teachers as influential role players in the learning and teaching of mathematics viewed and experienced the role of the CA.

From the data and findings it can be concluded that teachers see the current educational role of the CA as problematic and limiting, based on the low frequencies of interaction and communication to engage on issues related to mathematics teaching. The school visits seem to be by teachers in the study to be inadequate with respect to purpose. Based on the data, it seems as if no or limited lesson critique or post-lesson reflection occurs. From the responses it appears that many teachers believe that they have the right to refuse help, or intervention, from the CAs. These views to power relations may hamper growth and improvement of the quality of teaching mathematics. It is heartening that a considerable number of teachers expressed the need to be assisted by the CA in broadening their content knowledge and teaching skills. The survey results also corroborate international findings related to negative perceptions of school inspections (Chapman, 2001).

The findings in this study are consistent with the views expressed by teachers and other role-players about the state of education in South Africa in the 2009 review report which was a national endeavour (DoE, 2009b). Many of the views expressed point towards an unclear understanding regarding the role of the CA, as well as a lack of transparency within the advisory system, which is experienced as essentially top-down (London, 2004) in the way it operates. Any future plans to make meaningful changes to the curriculum advisory services in South Africa needs to involve the teachers since they could make a significant contribution in planning and streamlining an effectively operated advisory service or inspectorate.

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