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# Teacher learning and collaboration in a life sciences cluster in South Africa

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There is increasing focus on collaborative teacher learning in South Africa. In the Mpumalanga province, the Department of Education uses cluster meetings as a model of teacher development. Clusters are groups of teachers from different schools who teach the same subject. In this article we focus on the learning activities that took place in 1 cluster of life sciences teachers during 2016 and 2017. Data were generated by observing 6 cluster meetings (at provincial, district and circuit level), and by interviewing 11 members of the cluster and 2 departmental officials. Wenger's concepts of mutual engagement, shared repertoire and joint enterprise were used to analyse the data. The findings show that the professional learning activities that took place in the cluster meetings were mostly directed at improving the Grade 12 learners' results. The subject advisors, rather than the teachers, initiated the learning activities. The routines and resources used also focused on improving learner results. We thus argue that a managerial discourse of professionalism underpins the cluster model of professional development, primarily providing strategies intended to improve the pass rate of the Grade 12 learners and to monitor school-based assessment, rather than supporting collaborative professional learning.

**Keywords:** managerial professionalism; professional learning; teacher clusters; teacher development

## Introduction

There is a global shift towards collaborative models of professional development, such as professional learning communities, that acknowledge the complexity of the teacher-learning process (Avalos, 2011; Bantwini, 2019; Brodie & Borko, 2016; Korthagen, 2017; Opfer & Pedder, 2011; Wei, Darling-Hammond, Andree, Richardson & Orphanos, 2009). Teacher development policy in South Africa also supports collaborative professional learning by establishing professional learning communities of teachers (Department of Basic Education [DBE], Republic of South Africa [RSA], 2015).

Subject clusters are a model of professional development that embraces collaboration and that are used by some provincial departments of education in South Africa.[i] A cluster is a grouping of senior secondary teachers who all teach the same subject at different schools, led by a teacher who is appointed as the cluster leader. In 2012, the Mpumalanga[ii] Department of Education established various subject clusters as a model that aims to support the teachers at school level, as many district curriculum advisors are not necessarily able to visit all schools to provide the required support to teachers (Mpumalanga Department of Education, 2012). The focus of the study reported on here was teacher professional learning in a cluster of life sciences teachers who taught Grade 10 to 12 learners.

In the first section of this article, we present the literature on teacher development in South Africa and scrutinise the concept of teacher learning, drawing on Wenger's (1998, 2009) social learning theory informed by learning in a community of practice as a conceptual framework. We then discuss the methods, the findings, and conclude that the data suggest that the cluster meetings in this case study were underpinned by a discourse of managerial professionalism focusing more on monitoring and policy compliance, than on supporting teacher-led collaborative learning.

## Literature Review

### *Overview of professional development in South Africa*

Basic education in South Africa faces a range of challenges, such as low achievement rates, poor school resourcing and organisation, slow curriculum coverage and teachers' weak content knowledge (Meyer & Abel, 2015; Taylor, 2019; Venkat & Spaull, 2015). Teacher professional development is seen as a key intervention to improve quality outcomes of schooling. Professional development activities in South Africa have been closely linked to policy implementation in the post-apartheid era over the past 25 years. The numerous curriculum reforms have been accompanied by centralised training workshops for teachers, which were not always successful in conveying the underpinning principles of the reform or in changing teachers' practice (Bantwini, 2009; Department of Education [DoE], 2009; Walton, Nel, Muller & Lebeloane, 2014).

An important policy is the Integrated Strategic Planning Framework for Teacher Education and Development in South Africa 2011–2025. Its main aim is to "[i]mprove the quality of teacher education and development in order to improve the quality of teachers and teaching" (DBE & Department of Higher Education and Training [DHET], 2011:1). The policy document tasks provincial departments with providing support to teachers at the local level. It notes that one strategy is to create professional learning communities to enhance teacher professionalism (DBE & DHET, 2011:13).

Many studies agree that professional learning communities (PLCs) can be an effective model of professional development and that teachers should initiate PLCs and focus on aspects of teaching that they have

identified as important (Brodie, 2013; Brodie & Borko, 2016; Feldman & Fataar, 2017; Vescio, Ross & Adams, 2008). Studies suggest that for PLCs to be effective, teachers should be the ones to initiate PLCs and these should focus on aspects of their practice that they have identified as important (Darling-Hammond & Richardson, 2009; Feldman, 2020). In contrast, South African policy suggests that PLCs should be created by the department. This indicates that these may become instruments of bureaucratic accountability, rather than teacher-initiated communities (Brodie & Borko, 2016). There is a range of research on PLCs in South Africa focusing on partnerships between teachers and universities (for example, Brodie, 2013; Feldman & Fataar, 2017) or partnerships between teachers, support agencies and the DoE (VVOB Education for Development, 2017) or research on clusters run by provincial departments of education (Jita & Ndlalane, 2009). With this article we aim to add to our understanding of how clusters may or may not operate as a learning community that supports collaborative teacher learning.

Different models of professional development, be they workshops or PLCs, are not simply ways of delivering continuing professional development (CPD), but are also underpinned by assumptions about how teachers learn. Two different ways of understanding learning are described by Sfard (1998:10), who argues that in the "learning as acquisition" metaphor learning is viewed as the acquisition of knowledge or skills that then become the possession of the person. This is congruent with the cognitive theories of learning that assume that teachers will be able to transfer their learning to new contexts. Cognitive theories do not account for the different contexts of learning or the problem of transfer (Kelly, 2006; Postholm, 2012). In contrast, in the metaphor of "learning as participation" learning is regarded as a collaborative process that requires participation in a community of people who are learning together. From this perspective, learning is seen as a socio-cultural endeavour that should take the teacher's identity and the context into account (Kelly, 2006; Opfer & Pedder, 2011). Generally, researchers agree that collaborative models of teacher development are informed by a socio-cultural perspective on teacher learning, which theorises learning as a social practice (Brodie & Borko, 2016; Feldman, 2020; Wenger, 2009).

Kennedy (2014) goes further by arguing that different models of professional development reflect different underpinning discourses about teacher professionalism. Models that are informed by a managerial perspective on professionalism tend to understand learning as the acquisition of knowledge that teachers need to implement policies efficiently and focus on externally imposed accountability. In contrast, professional development models such as PLCs or action research should enable teachers to take agency over their own professional learning and position themselves as active change agents. This reflects a democratic professionalism that "privileges collaboration, openness, teacher agency and an overt commitment to social justice" (Kennedy, 2014:695).

### *The cluster model of professional development*

A model that is used in some provinces in South Africa supports collaborative learning in the form of teacher clusters (Jita & Mokhele, 2014; Jita & Ndlalane, 2009). Secondary school teachers from a range of schools in a circuit are grouped according to the subject they teach. According to the Mpumalanga Department of Education, the cluster meetings were established to

> [p]rovide teacher development opportunities; develop subject purpose for teachers; monitor progress of projects/assignments/schools-based activities and assessment tasks; ensure standardisation on the moderation process on a continuous basis; develop the necessary support material for teachers and learners; improve management of education in classrooms; regulate the activities of clusters with the purpose of working towards achieving quality education for all; provide teachers with capacity building opportunities through cooperative support between schools and develop common assessment tasks, and share their expertise. (Mpumalanga Department of Education, 2012:8)

This policy is quite vague about exactly who is responsible for these tasks, e.g. who will monitor the assessment tasks, and who will develop the support material? In addition, some of these aims indicate the purpose of providing teacher development and capacity-building opportunities for teachers, while other purposes refer to monitoring and regulating activities. Thus, a key question that prompted this study was to what extent the learning opportunities afforded by the cluster model are supportive of professional learning and to what extent these are focused on monitoring teachers' work?

## Conceptual Framework

Since the clusters are broadly informed by the notion of collaborative learning, Wenger's concept of a community of practice was deemed to be useful to analyse the data. Wenger (1998:227) defines learning as "[a]n interaction between personal experience and social competence." He understands that learning occurs by participating in a practice, rather than only by an individual acquiring knowledge (Wenger, 2009). These practices are situated within communities of practice "which negotiate joint enterprises that members work towards, ways of engaging with each other in pursuit of these enterprises, and

repertoires or languages for negotiating meaningful interactions and progress towards agreed goals" (Wenger, 1998, cited in Brodie & Borko, 2016:4).

People who learn together in a shared practice of human endeavour form communities of practice. We agree with Brodie and Borko (2016:5) that PLCs, "are a special kind (i.e. a subset) of communities of practice with the distinguishing feature of professional learning."

A community of practice has the following dimensions of practice, which characterise the learning that takes place: joint enterprise, mutual engagement, and shared repertoire. The mutual engagement dimension entails members engaging with one another and sharing their competences and expertise (Amin & Roberts, 2008). It is how the members of the group work together to achieve the shared goal while building a set of shared values (Wenger, 1998). In this study, we understand mutual engagement to mean how the teachers do activities together in the life sciences cluster and why they do them. Thus, we analysed the data to understand how the teachers engaged with one another in the learning activities that took place.

Shared repertoire refers to the ways in which the members use different resources. Members develop a shared repertoire of resources which would include "routines, discourse, articles, lessons, and ways of doing things, i.e., symbols, stories, and actions" (Wenger, 1998:82). In this study we analysed the data to identify the routines, activities and ways of doing things that informed the learning as well as what artefacts were used as resources in the learning activities.

Wenger (1998:77–78) argues that a joint enterprise comprises a negotiated convergence of the range of ideas held by the members of the community. "It is as a result of the collective process of negotiation that reflects the full complexity of mutual engagement; it is the participants' negotiated responses to their situation and, thus, belongs to them in a profound sense; and it creates among participants relations of mutual accountability that become an integral part of the practice." In this study, we consider joint enterprise to encompass how the participants understood the purpose and intention of the cluster activities and how these joint enterprises were discussed and negotiated.

### Context of the Life Sciences Cluster

In this study we focused on a case study of a life sciences cluster in Mpumalanga. There are four educational districts in the Mpumalanga province, which are divided into circuits. Each circuit comprises several schools. Life sciences teachers participate in different kinds of professional learning activities at the circuit, district, and provincial level.

At the circuit level, the teacher clusters are co-ordinated by a cluster leader, who is selected by the life sciences subject head from among the Grade 12 life sciences teachers in the circuit. The provincial office appoints the cluster leader at the beginning of the year. He or she must have been teaching Grade 12 for at least 3 years and shown excellent learner grades. The cluster leader is responsible for organising and planning cluster meetings at the circuit level. The cluster leaders assist the curriculum advisor in managing the clusters in the district. The main activity that takes place at the circuit level each term is the moderation of school-based assessment tasks.

The provincial workshops are open to all life sciences teachers in the province. These are the responsibility of the subject head who is assisted by the curriculum advisors. Teachers from all high schools that are under-performing in the Grade 12 examinations must attend these workshops. At the district level, content enrichment workshops focus on both life sciences content and pedagogy. Teachers from several circuits in a district may attend the workshops, which focus on how to teach topics that learners find difficult, like genetics and evolution. Teachers share their best practices of how they improve the Grade 12 results.

## Methods

The study was a qualitative case study of the professional learning of teachers in a life sciences teacher cluster during 2016 and 2017 (Mxenge, 2019). The cluster was purposively selected from a circuit in Mpumalanga because it was deemed to be working well according to the provincial policy, which requires regular meetings, subject support and moderation of school-based assessment. The circuit studied has 12 secondary schools and 21 life sciences teachers.

Semi-structured interviews were conducted with two departmental officials and 11 purposively selected life sciences teachers who belonged to the cluster (including the cluster leader). The selection criteria were that the teachers had been teaching Grade 10, 11 or 12 learners and were willing to participate. Five of the teachers had 2 or 3 years of teaching experience (thus were considered novice teachers), four had 4 to 7 years of teaching experience and two had been teaching for more than 15 years. The departmental officials were the curriculum advisor who worked at the district level and reported to the subject head, and the subject head who managed life sciences for the entire province. A semi-structured interview schedule with open-ended questions was used to ensure that the type of activities and the purpose of the cluster were systematically discussed. Interviews lasted an average of 45 minutes to an hour. These were audio

recorded and transcribed.

In addition, Author 1 was a non-participant observer of six workshops, two of which were offered to cluster members at a provincial level and four at the district level. Data were recorded through detailed field notes of observations. Documents that were circulated in the workshops were also used as part of the data gathered. However, the analysis of these documents is not presented in this article.

Regarding ethical considerations, gatekeeper permission was granted by the Mpumalanga Department of Education and the University of KwaZulu-Natal. The participants signed consent forms and were made aware that the research exercise was voluntary, and that they need not participate if they were not comfortable (Babbie, 2008).

## Findings

As the study progressed, it became clear that the professional development activities offered at the provincial and district level comprised large numbers of teachers (approximately 200 at provincial level and 35–70 teachers at district level), which meant there was little teacher negotiation as the activities were centrally planned by the subject advisors. We used the concepts of joint enterprise, mutual engagement and shared repertoire to analyse the nature of the professional learning activities at these different levels, although it became clear that these dimensions were not always present. We first present descriptions of the various learning activities that took place, analyse these according to these three dimensions and then critically discuss the findings.

The two provincial workshops that were observed targeted teachers from under-performing schools (schools where less than 60% of Grade 12 learners pass the National Senior Certificate examinations). The first observed provincial workshop was attended by 204 teachers and took place over a day and a half (Saturday and Sunday) at the end of Term 1, 2017. There were three kinds of learning activities: presentations given by the departmental officials, teacher group work and teacher group presentations. Firstly, the subject advisor gave a presentation on the challenges that learners faced in the topics of evolution and genetics, which are topics that the Grade 12 learners struggled with in the previous year's examination. Teachers were then divided into groups of about 15 to 20 teachers to discuss how they would best teach one of three topics: evolution by natural selection, Lamarckism and Darwinism, and punctuated equilibrium. For the second activity, five groups were selected to present to the whole group on their topic, with a focus on the content, rather than the teaching strategies. The third activity was a presentation by the curriculum implementer and subject advisor of the annual teaching plan (ATP) (that is, what topics needed to be covered in Term 2) and moderation and setting of the examination papers. There was some opportunity for teachers to share their challenges after the presentation. Teachers were discouraged from covering the topics that would not be assessed at the end of the year and were encouraged to pay attention to past examinations, by setting test questions in a similar manner.

The second provincial workshop observed focused on the content of genetics. Two education experts from the local national botanical gardens led the workshop which started at 18:00 on a Friday afternoon and continued until the Saturday afternoon. Teachers were asked which topics within genetics were most challenging to them. They were then given an activity to discuss in groups - the phases of meiosis and how best to teach it. This was followed by presentations from all groups. The presentations incorporated both how to teach meiosis and at the same time integrate the content. The same routine was followed on the Saturday with teachers sharing best practices of teaching genetics. They also discussed the examination guidelines.

Thirty-five teachers attended the first district-level workshop that was observed. The workshop was presented for 2 hours after school. It was facilitated by the curriculum implementers. The focus was on the Term 3 content requirements and the challenging topics. Teachers acknowledged the topics which learners found difficult, which were identified through analysis of the previous year's results. Teachers had the opportunity to raise their learners' challenges (for example, one teacher noted that his learners struggled with language and terminology). At another one of the four district-level meetings observed, the teachers' content knowledge of a specific topic was tested orally by the subject advisor. The curriculum advisor also provided Microsoft PowerPoint slides of various topics and encouraged teachers to use these in their lessons.

At both provincial and district-level workshops a key activity was the analysis of the previous terms' examination results, which was led by the curriculum implementers. This entailed both comparing the results of schools in the circuits and identifying the topics in which learners performed most poorly. In the workshops observed, teachers were not asked to discuss the learners' underlying conceptual misunderstandings or any remedial strategies that might improve learners' understanding. Instead, the curriculum advisor suggested that study guides, which focus on memorisation of content, were the solution to improving results.

At the circuit-level meetings 21 teachers from 12 different schools attended. Two main activities

were carried out, namely moderation of school-based assessment and team teaching.

Moderation of school-based assessment took place at the circuit level. The purpose of the moderation activity was for the cluster leader to monitor the teachers' progress in covering the curriculum, meeting the assessment requirements and to moderate the consistency of the marking of school-based assessments. Learners' first term assessment tasks are marked by the teachers at school. A teacher's file must contain the ATP, lesson plans, the assessment plan and the marked assessment tasks. These are checked by the head of department at the school and then by the cluster leader in the cluster meeting. The cluster leader sits at a table and the teachers queue up to hand in their files to be checked.

Team teaching involves one teacher teaching learners from several schools in a central venue, observed by other teachers. Two teachers, Ziduli and Slhoqo noted that teachers in their cluster (from 12 secondary schools) arranged for all their Grade 12 learners to meet in a central venue, where teachers who had expertise in teaching particular topics taught all the learners.

### Mutual Engagement: Learning Activities and Sharing Expertise

According to Wenger (1998), the mutual engagement dimension entails members of a community engaging with one another and sharing their competences and expertise. The nature of the teachers' working together and the learning activities that they engaged in was different at the three system levels as shown in the previous section.

Observation of two provincial workshops and four district-level workshops indicated that departmental curriculum advisors initiated and planned most of the activities at these workshops. Teachers could not influence the direction that the workshop might take as the departmental officials managed the process. Teachers were able to raise challenges linked to content or pedagogy they experienced in the classroom but not to other concerns. For example, when a teacher in a district meeting complained that a lesson of 40 minutes was too short to teach one topic, the curriculum advisor simply said that the teacher needed to discuss the problem with her head of department at school.

For both of the provincial workshops, it was clear that the size of the teacher groups meant that there was not much opportunity for mutual engagement, although the task given did allow some teachers to share their expertise. Much of the workshop time was taken up with presentations of policy documents like the ATPs and the examination guidelines. Teachers were not given opportunities to negotiate the activities.

In the four district-level workshops observed, there was some opportunity for mutual engagement. The curriculum advisor called on selected teachers to share teaching strategies that they found to be worthwhile. Two early-career teachers indicated in their interviews that they found this sharing of teaching methods very useful:

> *Because in these meetings we help each other by giving methods on how to teach these difficult topics. So, in a way I say they really help me because I can now teach these two topics* [meiosis and evolution] *but not to the desired level or expected level of the department.* (Bume, 3 years teaching experience)
>
> *There was a problem with that topic evolution, on how are you going to start teaching evolution? How can you explain so that the learners can understand you if you are talking about evolution...? So, they choose one teacher who is good at explaining, discussing, and explaining all about evolution. So, that guy, he explained a lot about evolution … Even myself, I learned something from that topic*. (Marhoza, 3 years teaching experience)

At the circuit level, Ziduli noted that teachers organise team teaching opportunities for their learners, and that teachers in the cluster share contact details and have created a WhatsApp group for sharing important information. This was the only example of teachers taking initiative for their own professional growth.

> *Yes, the cluster teachings that we organise here is that … we organise all our learners … they go to a particular place. We organise a centre where they meet on weekends and then we invite teachers from different schools to come and teach the different topics.* (Ziduli, 7 years teaching experience)

### Shared Repertoire: Learning from Activities, Tools, and Discourses

Wenger (1998) argues that a community of practice develops a shared repertoire of communal resources that includes the ways in which the members engage in activities, the discourses and the resources used. "A shared repertoire refers to ways of doing things, using words and tools, as well as concepts that the community has produced or adopted, throughout its history, that can be reified in shared histories and documents" (Johannesson, 2022:414).

Observation of the two provincial, four district workshops and circuit-level moderation showed that these followed the same routines or activities. These routines included presentations of the content of challenging life sciences topics (such as genetics and evolution). Thereafter, groups of teachers were given instructions for a group activity based on the topic. When they had finished, they presented this to the entire group. The moderation of school-based assessment at the circuit level also followed the same routine each term. However, there was no evidence that the

teachers established these routines, except organising team teaching of learners in central venues.

Wenger (1998:83) describes discourse as a means of "creating meaningful statements about the world." The discourse in the workshops observed supported the notion that the most important goal was to ensure that the Grade 12 learners passed the examination. In one district-level workshop, the subject advisor exhorted teachers to stick closely to the examination guide. In another, the curriculum advisor told teachers to emphasise the definitions of scientific terms to their learners, as this section of the examination paper carried more marks. Pharara, who has been teaching life sciences for 2 years, noted this in her interview:

> *It is very important to clearly note the terms because there are a lot of marks for learning the terms. If learners master the terms, as we have to tell them the structure of the question paper, you will find that in the first section learners* [could gain] *a lot of marks….*

In one district-level workshop, a teacher was scolded when he wanted to focus on other areas that were not to be assessed at the end of the year. Teachers were advised on how to achieve a 100% pass rate, with tips that included teaching their learners terminology ("definition of terms" is an important section of the life sciences examination paper), using previous years' question papers and adhering to examination guidelines.

The life sciences district and provincial workshops used artefacts or resources that were provided by the subject advisor such as past Grade 12 examination papers, examination memoranda, examination guidelines and Microsoft PowerPoint slides for teachers to use for teaching specific topics like evolution or genetics. However, none of these were created by teachers.

It was clear that the provincial DoE directs the routines and provides the artefacts. The resources were mostly policy documents that regulate teachers' work. The workshop routines did not allow teachers to create their own teaching resources. Thus, there was no shared repertoire in the sense of teachers working together to create resources. The focus on "best practice" seems to assume a one-size-fits-all approach that does not consider the diversity of the learners, the contextual conditions nor the varied needs of teachers in different schools.

### Joint Enterprise: Purpose of the Cluster Meetings

Wenger (1998:1) refers to common purpose as one of the aspects of "joint enterprise" of a community of practice. In this section, we focus on the ways in which the participants talked about the purpose of the cluster and on how the understandings of the purpose were negotiated. Wenger (1998:81) argues that mutual accountability relations born from joint enterprise negotiations include "what matters and what does not, what to do and not to do, what to pay attention to and what to ignore, what to talk about and what to leave unsaid, what to justify and what to take for granted, what to display and what to withhold."

Both departmental officials said that they understood the clusters as a structure that aimed to enhance the teachers' capacity so that the Grade 12 pass rate improved. The focus was on teachers being "taught" and "capacitated" reflecting a deficit discourse. The subject head, Punky, said the following about the teachers:

> *They will be capacitated; they will be taught here for certain days so that they can improve the results in their clusters and they are also responsible for their clusters in the sense that after a quarterly test or the June exams they are expected to analyse the results of their cluster*.

While teachers explained their understanding of the purpose in different ways, the main focus was on being able to fulfil the curriculum coverage requirements, understand the assessment policy and to analyse the examination papers, so that teaching could focus on these topics.

> *The purpose of the intervention workshops is to unpack the syllabus so each and every teacher must be aware on what to teach every term … and also the tests that they have to conduct and also the informal test and the formal test which is the exams*. (Marhoza, 3 years teaching experience)
>
> *Eh … I think the cluster meetings are there to make us see where we are with our syllabi, to notice whether you are on the right track or you are behind* (Duke, 7 years teaching experience).
>
> *To help each other, to discuss the papers, for example after we have written a paper we need to discuss to see the difficulty of the paper and to discuss the memo if it's wrong or then if the paper was difficult then we want to see the challenges then if there are difficult topics, we can discuss these, so that we can help each other, so that teaching will be fruitful*. (Slhoqo, 7 years teaching experience).

Slhoqo regarded the purpose of the clusters for teachers to support one another, although she also framed this support as being in relation to improving learners' achievement.

From the observations and interview data, there did not appear to be a need for negotiation regarding the purpose of the cluster activities as both teachers and officials agreed that the main goal was improving the learners' achievement. This may be because these were high school teachers with a specific focus on the Grade 12 year. However, it is certainly problematic that the teachers and the departmental official regarded the purpose of professional development in such a passive and narrow way. This does not support teacher participation and initiative (Bertram & Mxenge, 2023).

## Discussion of the Findings

The data show that the provincial DoE sets the agenda for the cluster meetings and their main objective is to improve the performance of the learners in the Grade 12 life sciences examination. This joint enterprise was not negotiated with teachers. The focus of the activities and discussions at provincial and district level was on teachers delivering the prescribed curriculum content with the aim of improving the matric results at the end of each year. This is a narrow understanding of the purpose of schooling, although it is one that is increasingly common (Labaree, 2014).

A key focus of the provincial and district-level workshops was on improving teachers' content knowledge of topics that learners find difficult, providing different teaching strategies, focusing on ensuring that learners meet the examination demands (e.g. by teaching the definitions of terms very explicitly). There was some teacher engagement in the smaller groups in these meetings, although the discussion tasks were determined by the departmental officials and not by the teachers. At the circuit level, teachers took more initiative by arranging team-teaching sessions for their learners. However, the purpose of this team-teaching support was still to improve the learners' results. The repertoire of resources used in the workshops (examination papers, examination guides, database of results per school, Microsoft PowerPoint presentations) were created by the subject advisors and not by the teachers and could thus not be called a shared repertoire. The analysis makes it clear that the aspects of Wenger's framework of shared repertoires, mutual engagement and a negotiated joint enterprise were not strongly present.

We thus argue that a managerial discourse of professionalism underpins the cluster model of professional development in this case study. This means that teacher professionalism is defined as teachers complying with policy requirements and external regulations (Day & Sachs, 2004). The managerial discourse approach is characterised by bureaucratic accountability and monitoring, rather than a holistic focus on teachers' work and professional learning. While research on PLCs usually emphasises the importance of collaborative learning that is initiated by teachers, the cluster activities at district and provincial level did not reflect much teacher-initiated collaboration. One of the key practices advocated by social practice theory is collaborative learning, which is learning by co-participating in a community (Wenger, 2009). In contrast, the teacher-learning theory that underpins these workshops appeared to be behaviourist in nature, which understands learning as acquisition rather than as participation (Sfard, 1998). It seems clear that the cluster model of professional development is not informed by a strong belief in learning as participation as espoused by socio-cultural learning theories.

Teachers, particularly novices, in the study articulated that they learned from the activities in the provincial and district-level workshops, specifically how to teach particular topics better, which was positive. The official curriculum states that the purposes of learning life sciences are for the learners to develop an in-depth knowledge of biological concepts, and to be able to critically evaluate and debate scientific issues and processes; to appreciate the importance of conservation; become environmentally-aware citizens and to develop scientific ways of thinking (DBE, RSA, 2011). However, these expansive purposes of learning life sciences were not emphasised in the observed cluster meetings. The department's managerial approach appears to overlook the broader purposes of learning life sciences and focuses on the measurement of the learners' performance.

Biesta (2015) cautions that a focus on measurement only engages with one of the purposes of education, namely, the purpose of qualification. It compromises the fulfilment of education's other purposes of socialisation and subjectification. Socialisation refers to how education enables us to become members of particular social, cultural, and political orders and subjectification refers to the individual becoming autonomous and independent in their thinking. Biesta (2009) argues that all three of these purposes of education are important. One of the aims of South Africa's curriculum is for learners to develop the knowledge, skills and values that will enable both self-fulfilment and meaningful participation in society. However, it seems that these broader purposes of socialisation and personal development are overshadowed by an obsession with measuring learner achievement, which is reflected in the purposes of professional development offered by the provincial DoE.

## Conclusion

Given the reality that only half of all children who enrol in Grade 1 will reach Grade 12 (Spaull, 2015), perhaps this managerial stance is appropriate to strengthen the current outcomes of the schooling system. The downside is that it weakens teachers' capacity to take agency for their professional learning and to tailor it towards their specific needs. The current policy on teacher development notes that it "places teachers firmly at the centre of all efforts to improve teacher development and enables teachers to take substantial responsibility for their own development" (DBE & DHET, 2011:1). This case study shows that this was not happening in this cluster in Mpumalanga and we recommend that teachers are given more opportunity to drive their

own professional learning, which should be more expansive than the narrow goal of improving learner results. Of course, this means that teachers need to be willing to take on this responsibility and imagine themselves as agents with professional judgement who take initiative for their own professional learning (Calvert, 2016).

### Authors' Contributions

Data were generated by Ntombi Mxenge for her Doctor of Philosophy (PhD) study at the University of KwaZulu-Natal. Both authors had an equal part in the conceptualising and writing of this article.

### Notes

i. While education policy is promulgated at a national level in South Africa, each of the nine provinces has a provincial department of education that is responsible for implementing policy.
ii. Mpumalanga has a population of 4 million people, of which 1,045,972 are learners in schools. This represents 8.2% of all learners in South Africa. There are 34,825 teachers in Mpumalanga, which is 8.0% of all teachers in South Africa (DBE, RSA, 2019).
iii. The data are drawn from the first author's PhD study.

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