Art. #2125, 10 pages, https://doi.org/10.15700/saje.v43n2a2125

Partnership as a strategy to overcome the difficulties associated with policy implementation: South African teachers' views

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The purpose of the study reported on here was to investigate the role of partnerships in helping in-service teachers overcome the difficulties associated with performing practical work prescribed in the Life Sciences Curriculum and Assessment Policy Statement (CAPS), an educational policy intended to transform the South African school curriculum in the wake of the apartheid years. CAPS is the latest of a plethora of educational policies that have been introduced in post-apartheid South Africa. However, teachers have lamented the lack of skills and resources necessary for its effective implementation. With this study we investigated how partnership between schools and 1 university in South Africa helped teachers to acquire practical skills and techniques related to CAPS implementation. A qualitative research approach with purposeful sampling was used. Data were collected through focus-group interviews, document analysis and observations that entailed observing teachers performing the experiments prior to the training. Teachers from 22 secondary schools participated in this research. Collected data were analysed using Creswell's method of coding. Findings of this study indicate that partnership with the University helped equip teachers with the necessary skills and knowledge to perform science experiments, ultimately resulting in improved learner performance. Partnerships between schools and institutions of higher learning to enhance policy implementation are, therefore, recommended.

Keywords: Curriculum and Assessment Policy Statement; life sciences; partnership; practical work; skills; teachers

Introduction

South Africa faces several difficulties in producing competent teachers who are able to teach key subjects such as science (Hofmeyr & Draper, 2015:3). We focused on mitigating the challenges concerning life sciences through a partnership between schools and a department at an institution of higher learning as a strategy to improve teachers' practical skills and techniques. The department at one of the universities in South Africa initiated a project involving collaboration with schools in one of the sub-districts of the Northwest province through in-service training of teachers. The obstacles encountered by teachers while implementing CAPS were widely reported in the literature (Maharajh, Nkosi & Mkhize, 2016; Nunalall, 2012; Taole, 2015), with the unavailability of resources frequently mentioned. We investigated the role of partnerships between schools in a sub-district in the Northwest province and the university to overcome the lack of resources. As part of a community project initiated and funded by the university, life sciences teachers were trained in practical tasks and investigative skills, among other things, by having access to a fully equipped laboratory with the apparatus and chemicals needed to perform practical science work. Most of the teachers who took part in the training either taught at schools without laboratories or lacked the necessary apparatus and chemicals for conducting the required practical work.

In the South African life sciences curriculum, one of the key specific aims (i.e., Specific Aim 2) emphasises "Doing science or practical work and investigations" in Grades 10 to 12 (Department of Basic Education [DBE], Republic of South Africa [RSA], 2011:13). In this study we focused on the facilitation of Specific Aim 2 through collaboration between schools in one of the sub-districts in the Northwest province and the university presenting in-service training for teachers. The achievement of Specific Aim 2 requires resources, e.g., a well-equipped laboratory and teachers who can instil in learners the ability to plan an investigation, form a hypothesis, identify variables, follow instructions, handle equipment, adhere to safety rules, measure and record data, make observations, and interpret data (DBE, RSA, 2011:16). In addition to obstacles such as a lack of resources and inadequately equipped laboratories, the teachers were unable to respond effectively to the demands of the CAPS because they did not have the requisite expertise and knowledge to perform practical work (Maharajh et al., 2016; Taole, 2015). The importance of practical work in the South African context is indicated by the new educational reform issued by Minister Angie Motshekga (DBE, 2020). The reform resulted in 13 additional subjects in the curriculum with a strong focus on practical skills that could be of real use in the job market, something that necessitates teachers' training in practical skills.

Studies indicate that teachers have been experiencing challenges with the teaching of the life sciences curriculum (De Villiers, 2011; Ferreira, 2011) and it is in this context that the value of the type of partnership described is highlighted. In England, a national project was launched to improve the effectiveness of practical work in schools. Teachers were thus trained to teach learners how to perform experiments and apply their thinking (Abrahams & Reiss, 2012:1035). To mitigate the challenges associated with the teaching of life sciences, a group of researchers developed a framework that prepared teachers for life sciences/biology education (McComas, Reiss, Dempster, Lee, Olander, Clément, Boerwinkel & Waarlo, 2018). Moreover, full-

time partnerships involving schools, community groups, government agencies, and social services helped overcome some of the difficulties experienced by learners in a way that schools alone could not have done (Valli, Stefanski & Jacobson, 2014). The partnership considered in this study involved only two entities, namely an institution of higher learning and schools in a sub-district in Northwest. In this research, the university offered teacher training on performing experiments. The partnership closely resembled the partnership in Sealey, Robson and Hutchins' (1997) study, whereby collaboration between schools and universities improved teacher education. There is limited literature about part-time partnerships between two organisations to enhance performance, and I sought to bridge that gap with my study.

With this study I aimed to answer the question: What role did the partnership between the Department of Education (DoE) and the university play in assisting teachers to implement CAPS? The sub-questions were:

- Which gaps were identified from the baseline data gathered through observation and document analysis that informed the university's intervention?
- What were teachers' experiences of performing the practical tasks prior to receiving training?
- Which practical skills and techniques did teachers acquire from the training provided by the university team?

Literature Review

Scientific skills and knowledge

The objective of studying science is the accumulation of knowledge and understanding of science enhanced by practical work and experimental skills (Abrahams, Reiss & Sharpe, 2013:222). As an educational policy in South Africa, the introduction of the CAPS came with challenges, particularly regarding life sciences, as teachers were required to transfer scientific skills to learners instead of just imparting content knowledge (DBE, RSA, 2011:8). The United Nations Educational, Scientific and Cultural Organization ([UNESCO], 2015) has defined skills as the relevant knowledge and experience needed to perform a specific task. In life sciences, teachers are expected to show competence in the skills required to plan and conduct investigations and experiments (Ellinas & Suleiman, 2012). The research conducted by Maharajh et al. (2016) revealed that teachers experienced difficulties following the implementation of CAPS because they were not properly trained to deal with the required changes. To bridge the teachers' practical skills gap, De Guzman and Choi (2013:206) have suggested designing interventions that will lead to "career adaptation" that enable teachers to deal with new challenges in the workplace.

Professional development for teacher empowerment on practical skills and techniques

Teachers are confronted with a variety of curriculum changes that require participation in development activities (Heystek & Terhoven, 2015). For life sciences teachers in particular, there is a growing demand to equip teachers with practical skills that can enhance their teaching performance (Nguyen, Pham, Nguyen, Nguyen, An & Do, 2021), what Ogawa, Fujii and Ikuo (2013) refer to as a system of certificate renewal courses to empower teachers with advanced knowledge and skills every 10 years in cooperation with a university.

Literature suggests that teacher support in the form of professional development can equip teachers with knowledge and skills to provide quality teaching (Collett & Green, 2017; Darling-Hammond, Flook, Cook-Harvey, Barron & Osher, 2020). Teachers' professional development will enable them to equip learners with the skills that promote critical and creative thinking (Green & Collett, 2021). Ogawa et al. (2013) contend that learning through experiment study helps learners to understand science.

Several professional teacher developments have failed because they were not informed by an understanding of what knowledge teachers required (Bertram, 2011). A preponderance of literature regards effective professional development as informed coaching where there is a collaborative relationship between a coach and a trainee that culminates in pedagogical performance (Bastian & Marks, 2017; Ehsanipour & Zaccarelli, 2017; Mitchell, Keese, Banerjee, Huston & Kwok, 2021). In their study, Mutambuki and Schwartz (2018) indicate the effectiveness of a professional development strategy consisting of mentoring, support and observation by those who are empowered. This finding was supported by Nguyen et al. (2021) who indicate the need to incorporate experiments in biology teaching to compensate for inadequate classroom-only instruction. In addition, Ogawa et al. (2013) indicate that training teachers on practical work or experiments helps teachers to acquire knowledge and skills to prevent teacher burnout and increase teachers' engagement and resilience, (Christensen, Dyrstad & Innstrand, 2020).

Partnerships as a panacea for teacher development

The development of partnerships between the DoE and non-governmental organizations (NGOs) has proven to be one way of dealing with what Savickas (2013:152) calls "career inhibition", which refers to the inability to deal with unexpected workplace problems. Partnerships were entered into during the era of outcomes-based

education (OBE) to deal with policy changes through formal structures (e.g., the education department, universities, colleges of education, communities, and schools) coming together to help interpret the OBE curriculum framework for teachers (Onwu & Mogari, 2004:164). Thus, partnerships were seen to provide individuals with what they needed to achieve their goals (Valli et al., 2014:112). A partnership between departments of education and institutions of higher learning in the form of in-service training might, therefore, enable teachers to acquire new knowledge and skills (Cancedda, Farmer, Kyamanywa, Riviello Rhatigan, Wagner, Ngabo, Anatole, Drobac, Mpunga, Nutt, Mukherjee, Cortas, Condo, Ntaganda, Bukhman & Binagwaho, 2014). These skills could help teachers deal with the difficulties associated with the implementation of new policies in education.

According to Jones (2008), partnerships with universities equip schools and teachers to internalise and implement current knowledge and strategies. A collaborative interaction between institutions of higher learning and teachers is important, given that teachers lack the confidence, training, and resources to teach science (Jones, 2008:65). Thus, the professional development of teachers by an expert in the subject, in the form of in-service training, results in substantial improvements in teachers' teaching approaches. Consequently, interventions through in-service training for teachers, termed "workplace-based career development interventions" (Coetzee, Ferreira & Potgieter, 2015:7), have the potential to promote teachers' career confidence.

Theoretical Framework

My study is underpinned by the theory of alliance proposed by Iyer (2003). Alliance is defined as a working partnership in which there is mutual recognition and understanding that one partner's success depends, in part, on the other (Iyer, 2003:43). According to McQuaid (2000:15), partnership is a varied and "ambiguous concept" because there are significant differences between partnerships and within a partnership over time. While Carnwell and Carson (2008:15) regard a partnership as a connection between two organisations, with some informal agreements, Iyer (2003) suggests that partnerships can be formal or informal, depending on the partnership and partner characteristics. Irrespective of whether the agreement between partners is formal or informal, the outcome of any partnership is development because it provides resources that promote "enhanced efficiency and creativity", which might be out of reach of a single organisation (Hatton & Schroeder, 2007:157–158).

According to Iyer (2003), in a partnership one organisation's strengths compensate for the other organisation's weaknesses. This means that in an alliance the partner that possesses a resource that the other lacks will enhance the strength of the weaker partner. In the partnership between the university and the DoE, the university provided human resources who were experts in life sciences to bridge the gap in teachers' practical knowledge and skills.

Iyer (2003) mentions different types of partnerships, one involving the merging of two organisations, and the other with the parties maintaining their independent identities but entering in an alliance for a particular purpose. Partners must set the objective of such an alliance. For instance, one partner may gain advanced knowledge through the acquisition of skills to build its capacity to work effectively (Hatton & Schroeder, 2007). All partnerships stipulate the operation period or time frame, and Cancedda et al. (2014) explain that partnerships require constant evaluation, after which the future of an alliance will be determined.

According to Iyer (2003), all partners in an alliance must realise that the alliance's success depends on every one of the partners, so there must be a sense of commitment. Healey, Flint and Harrington (2014) state that a partnership relationship in which all participants are actively engaged is necessary to achieve a positive outcome. In the partnership under discussion, a sense of commitment was expected from the university's team in supporting teachers and teachers themselves abiding by the requirements set by the university to achieve good results.

Iyer (2003) further identifies certain necessary partner characteristics for the development of a fruitful partnership. For example, the success of a partnership depends on partner size; larger organisations have a greater range of skills and employ specialists that deal with specific tasks. The DoE agreed to partner with the university to benefit from the university's human and physical resources. By doing so, the government adhered to Islahuddin, Tolla and Mansyur's (2016:5919) assertion that the government must take full responsibility for enhancing such partnerships because it benefits from the collaborations.

The theory has important implications for the development of partnerships between institutions of higher learning and schools as representatives of the DBE. Alliances of this nature help schools (teachers in particular) acquire the skills and knowledge to assist them in policy implementation. A partnership project involving the university and life sciences teachers ultimately benefitted science education. Jones (2008:62) indicates that universities play an important role in teachers' professional development. Similarly, in the study under discussion, teachers received training from the university, and the university, in turn, used data

collected during the partnership to expand the scope of knowledge in research.

Methodology

Research Approach and Design

A qualitative research approach was used because the views of the participants who witnessed the partnership could be known only through dialogue. Since the study sample was not representative of the whole population of life sciences teachers, a case study design was considered the best approach for this research because only life sciences teachers from one sub-district of six were used as the sample for this study.

Participants and the Site of the Investigation

The target population for the study was 55 teachers in one sub-district in Northwest. I used purposeful sampling to select 22 information-rich participants who were knowledgeable about the subject, life sciences (Botma, Greeff, Mulaudzi & Wright, 2010:201). All participants had studied biology/life-sciences as one of the major subjects during teacher training and were teaching the subject at the time of writing. Each of the 22 schools that were invited to be part of the study sent one teacher who taught life sciences in Grades 10 to 12. Table 1 reflects the participants' profiles. The participants' right to information was upheld through member checking, and anonymity was preserved to protect the participants' image (Denzin & Lincoln, 2013).

Table 1 Participants' profile

Sample	Gender	Nationality	Age	Qualifications	Teaching experience
22	Male = 7	Black South Africans	25–27	Bachelor of Education = 5	2–3 years
	Female = 15		42–55	Diploma = 17	20–34 years

Data Collection Strategies

I received ethical clearance for this research from the ethics committee of the College of Education at the University for all components of the evaluation, and permission to conduct research was granted by the DoE in the sub-district. I used three qualitative data collection strategies, namely, focus-group interviews, document analysis and observation. Two focus-group interviews were conducted in this study, which allowed me to ask probing questions to explore what participants had said about the role played by the partnership to enhance curriculum implementation in greater detail (FocusGroupTips.com, 2012). Each focus group lasted 45 minutes and comprised male and female participants (Focus Group 1 = seven women and four men, and Focus Group 2 = eight women and three men). The participants' responses were tape-recorded, transcribed, and coded. Ethics principles such as informed consent, privacy, and confidentiality were applied to protect the identity of the participants (Denzin & Lincoln, 2013). I had developed a semi-structured interview guide, which created room for probing questions to be posed as a strategy to gain more information (FocusGroupTips.com, 2012; Jensen & Laurie, 2016). The same questions were asked in both focus groups:

- How often do you perform experiments in your respective schools?
- What challenges are associated with the performance of practical tasks in schools?
- Which skills and knowledge have you acquired from the practical skills training?
- How would you rate learner performance after applying what you gained from training?
- How did the training ease the stress of implementing CAPS?

Member checking was done in both interviews to increase the credibility and trustworthiness of the collected data. Triangulation was applied by using more than one data collection strategy, namely, focus groups and observation.

Observations were used as a data collection technique to see and hear what was occurring naturally at the research site. I played the role of a non-participant observer, while observing teachers performing the experiments prior to the training (Bryman, Bell, Hirschsohn, Dos Santos, Du Toit, Masenge, Van Aardt & Wagner, 2014:244). This was done to collect baseline data to identify gaps prior to planning teachers' empowerment.

Data Analysis

According to Patton (2002), data analysis involves segmenting and taking apart the data and putting it back together. I engaged in inductively analysing the data. The focus-group interviews were analysed using Creswell's (2013) method of coding, which entails reducing the data or patterns to meaningful segments and assigning names to the segments. The codes were then combined into broader categories or themes. These themes are broad units of information that consist of several codes aggregated to form a common idea. Three official documents were analysed in the study: Grade 10 to 12 life sciences textbooks, the Life Sciences CAPS, and the analytical moderator's reports about learners' performance on practical work-related questions. The observation-based data were also

analysed to identify gaps which I addressed during the training.

Results

Guided by the research questions, three themes emerged from the findings. I present the participants' verbatim responses for each theme. Additional responses are also provided where emphasis is needed.

Research Question 1: Which Gaps were Identified from the Baseline Data Gathered through Observation and Document Analysis that Informed the University's Intervention

The findings of this research reveal that the University identified some gaps regarding teachers' capabilities in performing practical work. Table 2 represents the observation tool that was used, as well as the results found.

Table 2 Observation schedule for collecting practical tasks baseline data prior to training (adapted from DBE, RSA, 2011:15–16)

Skills observed 7	Group A Grade 10 7 members	Group B Grade 11 7 members	Group C Grade 12 8 members
Follow instructions Adherence to safety rules	Steps were not followed consecutively and safety measures ignored	Steps were not followed consecutively and safety measures ignored	Steps were followed consecutively but safety measures were not applied fully
Handle equipment or apparatus • Knowledge of the apparatus, that is, being able to name items and knowing what they are used for. • Use equipment appropriately and safely	Not knowing names of apparatus Safety rules not followed to the latter	Not knowing names of apparatus Safety rules not followed to the latter	Knowing names of some of the apparatus. Some safety rules followed to the latter
Make observations • A variety of observations are possible, and observations can be recorded in different ways, such as: drawings; descriptions; grouping of materials or examples based on observable similarities and/or differences; measurements; comparing materials before and after treatment; assessment • observing results of an experimental investigation which will involve recording information in an appropriate way; and counting.	Observations made but not recorded	Observations made but not recorded	Observations made but not recorded
Record information or data This should include recording observations or information as drawings, descriptions, in simple table format, as simple graphs, etc.	Not done	Not done	Not done
Measure • Knowing what to measure (length, volume, temperature, weight or mass and number) • Knowing how to measure (having a sense accuracy)	Nothing measured	Nothing measured	Knowing what to measure but not accurate
Interpret Being able to convert information from one form to another, for instance, converting a table into an appropriate graph.	Struggling to draw a graph and unable to interpret it	Struggling to draw a graph and unable to interpret it	Could draw a graph but unable to interpret it

Guided by the document analysis of Grade 10 to 12 Life Sciences textbooks and the Life Sciences Curriculum and Policy Statement (CAPS), I realised that teachers were not following the seven steps of performing practical tasks and this led to poor learner performance in practical work-related questions.

Research Question 2: What were Teachers' Experiences of Performing the Practical Tasks Prior to Receiving Training?

Before the training, when participants were asked how often they performed experiments, only a few said "often"; while the majority said "sometimes", and some said "never." Those who responded

"often" taught at schools with laboratories and apparatus for experiments. One of the participants reported: "*I do the experiment regularly because my school has a well-equipped laboratory*" (Participant A).

However, it became evident from the study that the availability of a well-resourced laboratory did not automatically lead to the regular performing of experiments, as seen from the following response:

> *My school has a laboratory, but I do not engage in practical tasks often because I lack the expertise to do them. I did not receive training to do the practical work during my college years. I just met them now and the professional development we receive from our subject advisers seldom help us to deal with practical work challenges because they happen once or twice in a year.* (Participant B)

Ten out of 22 participants indicated that they were not doing practical experiments since their laboratories were poorly equipped with apparatus and chemicals. "*I only perform experiments when there are apparatus and chemicals to do it, most of the experiments I do not do them*" (Participant C).

Six out of 22 participants indicated that they never performed experiments because of a lack of resources and expertise. One of these participants stated: "*We do not have a lab at my school. My principal arranged with a local school to borrow us the apparatus, but I did not do them because I do not have the knowledge to do them*" (Participant D).

In response to a question about how insufficient practical work or the complete absence of practical work affected learner performance and the implementation of CAPS in general, one of the participants said:

> *CAPS is demanding, one must make sure that he/she covers all the Specific Aims 1 to 3. Most of us do not do justice to Specific Aim 2 which is doing science or practical work and investigations. So, our learners always fail to answer questions that relates to practical tasks.* (Participant C)

In this regard, Participant E reported as follows:

> *The new cohort of learners have a difficulty of understanding and remembering life sciences content. I have noticed that when you engage them in practical tasks, their interest in learning the subject is stimulated. Because they are actively involved, they master the content and they do not forget what they did practically.*

All participants complained about the time allocated for experiments and overcrowded classes. Two participants shared the following:

> *Practical tasks need more time and our school timetable does not cater for such; sometimes I ask learners to stay back after school to do them, but most of these learners do not attend* (Participant F).
>
> *I have more than 70 learners in my class, most of the learners do not become actively involved* (Participant G).

Research Question 3: Which Practical Skills and Techniques did Teachers Acquire from the Training Provided by the University Team?

After attending the in-service training offered by the university team, participants were asked what they had gained from the engagement. Two participants commented as follows:

> *The demonstration lessons by the university team helped me to understand all the seven skills needed to perform practical wok. Initially I thought experiments are difficult but now, oh, I can't wait to go back and do them. I never had the opportunity to observe someone demonstrating how to perform an experiment.* (Participant F)
>
> *It is difficult to understand the terminology used in CAPS textbooks. I did not have an idea of what the apparatus stated in the learner textbooks looked like. After seeing them during the workshop I realised that such apparatus is there in our laboratory.* (Participant B)

The understanding of CAPS terminology was further enhanced by the life sciences practical skills development manual developed by the University: "*The university team provided us with a user-friendly practical tasks manual which guided us in performing the experiments*" (Participant D).

Participants also indicated how excited they were when they were given the opportunity to perform the experiments themselves: "*I enjoyed doing the experiment myself and I also gained confidence, so I am ready to do the experiments*" (Participant C).

Participants also responded positively to teaching methodologies that they learnt from the university team.

> *I am going to use the same strategy used by the university team to group learners. I have discovered why teaching in groups did not work for me, I did not give each group clear instruction and I will also reduce the group to five members.* (Participant H)

However, teachers identified time constraints and conflicting activities as factors that prevented them from benefiting more from the partnership: "*There are so many activities taking place at school, sub-district, district, provincial and national level and sometimes we are unable to attend workshops arranged by the university team*" (Participant I).

Discussion

Based on the themes discussed, data indicate that teachers had a knowledge and skills gaps prior to the training, since they did not receive training at the colleges of education from which they had graduated. As presented in their profile, most teachers held a diploma, and this qualification might have decreased their chances of acquiring enough knowledge and skills. The baseline data from the observation schedule confirmed teachers' incapacity to perform practical tasks. Table 2 illustrates that teachers did not fully adhere to the

seven skills needed to perform practical work. Only participants teaching Grade 12 learners had some skills to perform practical work. I discovered that of the eight participants performing Grade 12 experiments, five held Bachelor of Education qualifications and were recently qualified. Conversely, participants performing Grade 10 and 11 tasks were unable to follow the necessary steps in performing experiments, and this group's participants only held teaching diplomas.

The gaps identified from the observation schedule further confirm the need to retrain teachers who graduated more than 10 years prior, which Ogawa et al. (2013:8) refer to as a "certificate renewal course" to enable them to acquire scientific knowledge and skills. Participant B's assertion that "*subject advisers seldom help us to deal with practical work challenges*" attests to the observed gaps. The findings reveal the critical role played by the University through partnership to enable teachers to adapt to the demand of the new policy that De Guzman and Choi (2013:206) refer to as "career adaptation."

The demands of the new educational policy (CAPS) illuminated life sciences teachers' inefficiency in performing practical tasks because they lacked the expertise to teach science subjects (Hofmeyr & Draper, 2015). Some participants performed experiments, while others did not. The handful who did were likely those who had recently obtained their degrees in teaching, because they were taught to conduct practical work.

It emerged from this study that even those who knew how to perform practical tasks were unable to do so because of their inability to understand the CAPS terminology used in learners' textbooks. Teachers from schools without resources such as laboratories, apparatus and chemicals could not do the practical tasks because they did not know or possess the material for practical work. This meant that even while teaching the theory of practical work, they did not convey the right information, and learners were, therefore, not faring well in assessments. The situation begged for an external intervention since internally subject advisors did not provide help. The schools' partnership with the University opened room for teachers' professional development which equipped them with the requisite knowledge and skills to perform practical work (Collett & Green, 2017; Darling-Hammond et al., 2020). The outcome of such an external intervention has proven that professional development by experts in the subject results in substantial improvement (Jones, 2008). Participant F attested that the University's training provided them with knowledge, skills and teaching methodologies to do practical work. The existing partnership between schools and the University in this study appeared to be an extension of available literature that reported on the importance of external help sourced by other countries to improve biology education and sharpen teachers' knowledge and practical skills in teaching science (Collett & Green, 2017; Darling-Hammond et al., 2020; McComas et al., 2018; Savickas, 2013). Emanating from the results of this study comes the need for an engaged scholarship by institutions of higher learning through which gaps are identified and reported through partnerships with communities. This study addressed the need for emphasising the role of partnership in enhancing curriculum implementation. Equally important is the role that partnership with curriculum developers and teacher formations can play in the development of the curriculum in this country.

As revealed in the study, the concern raised by participants about the lack of materials and apparatus to conduct science experiments became a push factor in considering partnerships. Simultaneously, the availability of a well-equipped laboratory at the University became a pull factor in the establishment of an alliance. The study revealed one of the benefits of partnerships which is sharing of resources – one organisation's strengths compensate for the other organisation's weaknesses (Iyer, 2003). Participants indicated that the demonstration lessons performed by the university team not only helped teachers to relate the CAPS terminology with science apparatus, but also helped them to master the seven practical skills that serve as CAPS learning outcomes. Equipping South African teachers with such skills will, in the long term, complement the Minister of Education's newly suggested policy to equip learners with requisite skills to make them employable and able to compete in the global market (DBE, 2020). Participants further indicated that the University's action in providing teachers with an opportunity to do the experiments increased their confidence in performing experiments at their respective schools. In addition, teachers also emulated the university team's teaching methodologies, such as dividing learners into smaller groups to enhance their teaching. The acquisition of new teaching methodologies provided teachers with a platform to grasp what they needed to achieve their goals (Valli et al., 2014:112), namely CAPS implementation.

Data presented in this study indicate that teachers' and learners' performance in practical tasks had improved since the inception of the alliance. Teachers' efficiency and creativity were enhanced, something schools alone might not have been able to accomplish (Hatton & Schroeder, 2007:157–158). Participants indicated that they started performing practical tasks after the training, and that schools purchased materials for practical experiments. The findings further indicate the important role played by the partnership through the development of a user-friendly practical life sciences training manual that enhanced teachers'

approach to dealing with practical tasks. The manual served as a guide which relieved teachers from stress (Christensen et al., 2020) caused by policy implementation challenges because teachers used it as a framework that prepared them for performing practical work (McComas et al., 2018). The general improvement of results in the sub-district, as indicated by one participant and the university team, is noteworthy.

Even though positive aspects emerged from the partnership, there were some limitations. Since the partnership was more top-down than bottom-up in nature, there appeared to be some conflicting activities that prevented the partners from fully achieving the goals of the alliance. Sometimes teachers could not attend the workshop due to conflicting activities and, therefore, missed some information. This attests to an assertion by Healey et al. (2014) that a partnership relationship in which all participants are actively engaged is necessary to achieve a positive outcome. If the schools had initiated the alliance, they could have aligned their activities in such a way that the workshops offered by the University were fully attended. The above challenge proves Iyer's (2003) theory of alliance which propagates that the success of partnerships relies on mutual recognition and understanding, a strategy to be followed in future.

Conclusion

With this study I focused on a relatively underexplored area, namely the role played by partnerships in helping teachers overcome the difficulties associated with implementing the CAPS. The partnership was in the form of teacher professional development where teachers were empowered with practical tasks, skills, and techniques. The University's in-service practical skills training for teachers culminated in improved performance among teachers and learners on experiments. The demonstration lessons offered by the training team and teachers' engagement in performing practical tasks were found to be essential in promoting teachers' confidence to do the practical work. The development of a training manual to assist in teachers' implementation of the CAPS appeared to be one strategy to deal with CAPS terminology. Evidence suggests benefits of partnerships aimed at enhancing learning, which aligns with the theory of alliance proposed by Iyer (2003). I recommend the formation of partnerships to be used as a tool for teacher empowerment initiatives in order to deal with content and skills gaps.

Based on the findings, the following recommendations are made:

- There is a need for the DoE to enter into partnerships with institutions of higher learning to empower teachers with the requisite skills.
- Institutions of higher learning should not always be the ones to take the lead in forming alliances.
- Teachers must engage in lifelong learning through institutions of higher learning to equip themselves with up-to-date knowledge and skills necessary to deal with a particular cohort of learners.
- A bottom-up rather than top-down strategy must be followed in partnerships, with the difficulties experienced by teachers informing the required intervention.

Notes

ii. DATES: Received: 16 June 2020; Revised: 26 March 2022; Accepted: 5 July 2022; Published: 31 May 2023.

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