

**Evaluation of activities and services  
of  
Mpumalanga Education Development Centres**

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**Evaluation of activities and services of the  
Mpumalanga Education Development Centre**

by

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## DECLARATION

I declare that the research titled “Evaluation of activities and services of the Mpumalanga Education Development Centre” which I hereby submit at the University of Pretoria, is my own work. I further declare that all the sources that have been used and quoted in this research have been acknowledged.

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**SIGNATURE**

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**DATE**

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I dedicate this dissertation to my family:

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Above all, I am so thankful to God for this new chapter in my life. Within the circle of His will, there are no impossibilities.

Isaiah 43:19 “Look, I am doing something new . . . I am making a road through the wilderness, and rivers in the desert.”

## LANGUAGE EDITING

### TO WHOM IT MAY CONCERN

I edited a draft manuscript of Ms ND Chambale's magister dissertation linguistically by recommending alternative suggestions for the use of English without changing the meaning of the original text yet maintaining the characteristics of her writing style. The given title was *'Evaluation of Activities and Services of Mpumalanga Education Development Centres'*. The manuscript was edited using the "Track Changes" mode in MSWord 7 and returned to the author electronically and accepted by the supervisor as satisfactory.

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## LIST OF ABBREVIATIONS AND ACRONYMS

ACE	Advance Certificate in Education
CAPS	Curriculum Assessment Policy Statement
CMT	Circuit Management Team
EDC	Education Development Centre
DBE	Department of Basic Education
DFID	Department for International Development
DoE	Department of Education
HET	High Education and Training
ICT	Information and Communication Technology
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
KPI	Key Performance Indicators
MST	Mathematics, Science and Technology
MDoE	Mpumalanga Department of Education
NCTD	National Centre for Teacher Development
NGO	non-governmental organisation
PCK	Pedagogical Content Knowledge
SACE	South African Council of Educators
SCK	Subject Content Knowledge
SMT	School Management Team
TC	Teacher Centre
TED	Teacher Education and Development
TRC	Teacher Resource Centre

## ABSTRACT

Nieuwenhuis (2007) defines Education Development Centres (EDCs) as teacher support centres consisting of activities and services that support the school curriculum and contribute to the teacher content knowledge and skills development. In addition, Johnson and Maclean (2008) suggested that an ideal EDC programme should be built on the foundation of an information infrastructure that includes materials, equipment and facilities, and direct services to teachers. However, EDC activities and services are shaped and influenced by multiple factors contributing to the teacher classroom practices. Attention to the EDC programme is further given to areas like: the organisational support to effect changes in teacher practices; the type of activities and services; learning through technology; and teacher perception towards the EDC activities and service.

Looking more closely at the way EDCs function and noting the benefits of keeping EDCs as teacher support centres, this study explored the EDC activities and services guided by the following sub-questions:

- What professional development activities and services do EDCs provide;
- What is the rationale behind the development of EDC activities and services;
- What is the quality of EDC activities and services in relation to the professional development of teachers;
- What are the teachers' perceptions of EDC activities and services?

The main objective of the study was to establish the extent to which activities and services in Mpumalanga EDCs relate to teacher classroom practices. A sample of 16 teachers responded to the questionnaire designed specifically for teachers while two subject advisors who facilitated activities at the EDCs and two EDC managers were interviewed. Currently the approach to professional development programmes tends to be fragmented. Hence, this study sought to improve the quality of EDC activities and services by alerting programme designers and advising against such a practice.

Furthermore, the intention was to provide feedback to programme designers and encourage the promotion of collegial planning in structuring such offerings.

The qualitative study approach followed, used the interview schedule as a primary source to collect data to gather as much evidence as possible and was backed by the teacher questionnaire, field notes and personal journal. The basic logic model guided the planning for the evaluation process in identifying elements to be evaluated and indicated relationship between the components: the input (resources that go into the EDC programme); output (activities the EDC programme undertakes to offer); and the outcome (teacher behavioural changes and benefits that resulted because of the activities conducted). This study focused mainly on the implementation processes to yield intended results.

The study identified various factors as significant to deliver quality activities and services to enhance teacher knowledge and develop skills: creation of realistic centre vision, develop quality activities to integrate content knowledge and pedagogical skills, promote teacher collaboration and active participation; and designing coherent activities aligned to the schools improvement strategies to meet teachers' need. Workshops were facilitated in a reform approach allowing active participation of teachers, for example, simulations in computer lessons and science experiments. However, the inadequate resources and EDC financial constraints limited the quality of activities and services.

Nonetheless, EDC activities and service possessed the quality to enhance teacher knowledge and skills, if they are designed to incorporate the research based key features (Haslam, 2008). Furthermore, the study noted that EDCs play a critical role in shaping the activities and services by designing reform activities, creating pedagogical space for teachers to come together and providing teaching and learning material including technological tools, like Internet, to advance with curriculum changes and spare teachers' time and cost for travelling to meeting venues.

**KEY WORDS:**

Education Development Centre; quality; professional development; logic model; efficiency; process evaluation; knowledge and skills; teacher practice; activities and services; key performance indicators;



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## CHAPTER 1

### OVERVIEW OF THE STUDY

#### 1.1 INTRODUCTION

The purpose of this study is to explore the extent to which education development centres (EDCs)<sup>1</sup> are providing quality activities and services to enhance effective teacher professional development. Professional development refers to the acquisition of skills and knowledge for personal development and career advancement and in this study, professional development of teachers is vital to ensure the quality of education in the schools. Effective teaching is central to quality education and is determined by teacher quality (Strong, 2004). Carter (2008) defines teacher quality as related to teacher effectiveness, which includes teachers' sound knowledge of content (subject content knowledge or SCK and pedagogical content knowledge or PCK), classroom management, teacher preparation and plans, and high quality assessment. Teacher quality is evident in the analysis of the relationship between the teachers' instructional behaviour and the measure of the learners' academic progress (Wenglinsky, 2001).

Removing ineffective teachers from schools or raising the entrance standard for teaching profession have not been effective ways for improving the quality of teaching in the schools. Similarly, placing the least effective teachers in lower grades will not improve teacher practices (Strong, 2004). Alternatively, focusing on improving the quality of teaching of the teachers already in teaching positions by investing in their professional development has proven to be the best strategy for raising learner achievement (Cohen, 2004).

Drawing upon the literature with regard to professional development, Villegas-Reimers, (2003) regards successful professional development to include activities based on curricula and instructional strategies to enhance teacher practices. This includes programmes running over a long-term process to address the needs of teachers in effectively implementing the curriculum. However, the definition of professional development should convey a clear purpose of the implementation of the programme. If the goal for a particular professional development programme is to improve learner achievement or teacher knowledge and skills,

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<sup>1</sup> This study uses the term education development centre (EDC) referring to education resource centre (ERC), teacher centre (TC) and teacher resource centre (TRC).

transferability has to be clearly expressed. To evaluate the quality of EDC activities and services, the definition for professional development as a desired goal will be regarded as the activities that develop an individual's skills, knowledge expertise and other characteristics as a teacher (OECD, 2009).

Central to the support of effective professional development, EDCs have a pivotal role to play in the provision of courses and material, consultative services and activities to upgrade teachers' knowledge and skills (Hoyle & Megarry, 2006). EDCs also provide a collaborative space where teachers interact in workshops and meetings. This pedagogical space thus creates pedagogical space to share knowledge and experiences. For this reason, it is vital that EDCs operate to effectively and successfully increase and develop teacher subject content knowledge (SCK) and pedagogical content knowledge (PCK). This means that EDCs need to focus on identifying their overall vision and then their mission which transfers to the design and development of programmes. The activities and services that the EDCs offer should support teachers in order to improve the quality of their teaching.

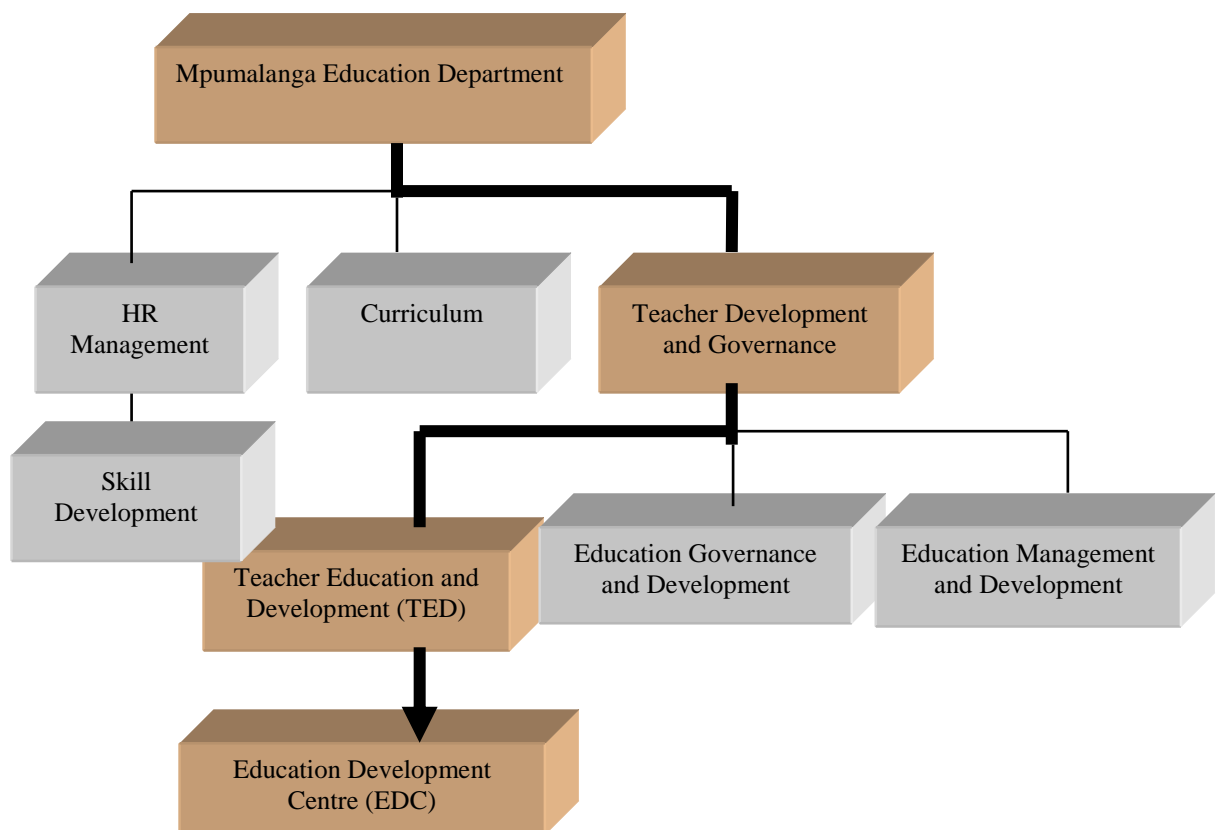
This chapter provides an outline to the study by firstly exploring the background (Section 1.2) to the context in which the activities and services are provided, followed by the problem statement (Section 1.3) where the general need of the inquiry and the gap in the literature is outlined. The reasons for conducting this study is articulated in the purpose of the study (Section 1.4) and the research questions (Section 1.5) elucidated how the research aims and objectives (Section 1.6) are to be attained. Section 1.7 provides an explanation on the significance of the study followed by the highlights of the research design and methodology is in Section 1.8, particularly the sampling process, choice of research instruments and data analysis procedures. The definition of terms (Section 1.8) is preceded by the outline structure of the dissertation in Section 1.10.

## **1.2 STUDY BACKGROUND**

EDCs are established primarily to support continuing teacher professional development (Weindling, Reid & Davis, 1983). EDCs were designed to organise, provide and coordinate access to continuing teacher support, in-service training and professional development, and Mpumalanga EDCs are no exception. This purpose is aligned with one of the 12 agreed-upon outcomes in the turnaround strategy for the Department of Basic Education which appears in

the *Action Plan to 2014 Towards the Realisation of Schooling 2025* (DBE, 2010). Central to the outcome to improve the quality of teaching and learning, is the focus on enhancing teacher capacity and practices as significant outputs of quality education. This outcome supports the importance of developing teacher content knowledge (SCK) as well as pedagogical content knowledge (PCK). Thus, this outcome is incorporated and integrated into the activities and services offered by the EDCs to ensure professional development of teachers.

EDCs in Mpumalanga fall under the Department of Education and are being managed by the Teacher Education and Governance section (See Figure 1.1 below). The functioning of EDCs falls under the umbrella of the Teacher Development Education (TED) at provincial level while the day-to-day management is the responsibility of the district. Monthly progress reports are completed and forwarded to TED section to monitor the running of the centres.



**Figure 1.1: Mpumalanga Department of Education (MDoE) structure**

This TED is primarily responsible for the coordination of teacher developmental programmes addressing issues arising from different structures, for example, skills development and curriculum support. Although there is a slight difference between the programmes that reside



within TED and those related to skill development, they operate in a collaborative and unified manner. While skill development focuses on the enrolment of school managers for Advanced Certificate in Education (ACE) and school leadership programmes as well as the enrolment of teachers for content enrichment, TED primarily focuses on the on-going professional development programmes for teacher development (DBE & HET, 2011).

The sixteen EDCs in Mpumalanga are well distributed in the districts across the province. They consist of one or more offices and meeting rooms with a computer room, laboratory and/or a library. They are run by the centre manager and assisted by one or more administrative support staff members. Some EDCs have been in existence for some time while others are newly built. This results in a wide variation in the EDC facilities (DBE & HET, 2011).

### 1.3 PROBLEM STATEMENT

This study formulates its problem statement from the report *The Effectiveness of the Implementation of Education Development Centre in Mpumalanga* by Nieuwenhuis (2007). It gives a number of objectives that uphold the EDC vision that it is a centre for organising, providing and co-ordinating access to on-going support, in-service training and professional development for reviewing and verifying these, they were deemed ineffective as this report focused on the overall effectiveness of the EDCs. EDC activities and services were not directly addressed, only reported on indicating minimal contact with teachers or their contact with EDCs. This approach has little to do with teacher professional development. As a result, this study sought to narrow its focus specifically to the management and implementation of EDC activities and services that are put in place to enhance the quality of teaching and further explore the quality of activities and services for teacher professional development, particularly as it assists in improving quality education provided by teachers.

An overriding concern is to find out why professional development programmes have failed and how to develop teacher competence. The problem has not been lack of professional development opportunities *per se*, but rather the quality of those programmes designed for professional development. Among other findings, the Hanover research report (2012) revealed that basic professional development needs among teachers include technological skills, practical learning experience and time for professional collaboration. Hanover further

states that teachers lack the technological skills associated with the new assessment systems in their classroom. Teachers need continuous support to integrate the new expectations to their classroom teaching and this is particularly relevant in the South African context, where curricular change occurs. Moreover, they need collaboration and opportunity to network with peers in the same grade and subject as well as a facilitator to guide them. Together with these needs, key themes that articulate teaching standards, that is, effective learning and teaching in a reformed education should be considered when developing a professional development programme. These standards are presented in the table below:

**Table 1.1 Key themes for teaching standards**

Theme	Description
Use of new knowledge and skills	Teachers need to impart skills and knowledge to compete global
Collaboration	Teachers need to engage in collaborative inquiry
Improved assessment	Teachers need competency in assessment development and the use of assessment data which include analyses to improve results
Use of multiple teaching strategies	Teachers must adapt to multiple approaches to learning.

**Source: adapted from Hanover report (2012)**

Professional development of teachers is important in improving quality education (Richard & Farrell, 2005) and specifically designed professional development programmes play a vital role in equipping teachers with fundamental knowledge and skills. However, Guskey (2000) highlights ineffective programmes on professional development as one of the core issues to be addressed.

Although professional development programmes were in place, they seemed to be fragmented. This situation arises when programmes are designed without consultation with the target group. Furthermore, there is a lack of coherence on the design of professional development programmes. Steiner (2004) mentioned that coherence of professional development activities has a positive influence on change in teacher practices. He noted that teachers are likely to realise improvement in their teaching practices when the activities are designed such that they form part of the overall improvement strategy of the school. The

issue is that professional development programmes that are not tailored to the classroom hold little relevance for teachers. It is critically important to have alignment of professional development programme both within and across programmes. Teachers often feel obliged to participate in professional development regarding programmes that tend to be a waste of time with little or no impact on addressing the day-to-day classroom needs (Guskey, 2000). In addition, many programmes are seen as impractical to implement mainly due to lack of planning and collaboration with stakeholders. By design, one-time workshop or training programmes focused on specific content do not necessarily support the process of professional development and it is therefore important that programmes geared towards professional development run over longer periods.

With the demand posed by several curriculum related reforms such as Curriculum 2005 (C2005), National Curriculum Statement (NCS), Revised National Curriculum Statement (RNCS) and the Curriculum and Assessment Policy Statement (CAPS), implementation of these policies at various times has become a concern of teachers. The curriculum reform has necessitated changes in the content (SCK), changes in teaching and learning material, textbooks and resources as well as changes in the teaching approach and strategies (PCK). Even though the current CAPS provides teachers with clear and unambiguous guidelines to teach and assess learners, teachers still need on-going training and support in the effective implementation of the curriculum (DBE, 2012). Historically, South African colleges and universities have trained teachers with less emphasis on SCK (DBE & HET, 2011). Similarly, the merging and closing of colleges from 1994 contributed to the shortages of qualified teachers and teachers with specialisation in their subjects (Surgue & Day, 2002). In addition, practising teachers have found it challenging to change and adapt to the new curriculum and therefore require assistance and support.

Having been involved in the education system in the Systemic Evaluation office of the Mpumalanga Education Department, the researcher noted that the needs of a significant proportion of teachers are often not fully met, especially, teachers from public and farm schools situated in rural areas of the province. It was evident that committed teachers who realised that they were in need of professional development would go to the extent of organising transport to attend Saturdays and holiday workshops arranged by Non-Departmental Organisations (NGOs). As a facilitator at such a programme event, the large number of attendees was highly motivated to extend their level of teaching competency. Research by Schleicher (2011) suggested that there is high participation rate in educational

conferences and workshops, which too indicates a desire amongst practitioners to improve their skills. This being said, research on factors that influence sound professional development is still limited. These findings raise concerns around the form of development programmes arranged by the Department, and the nature and quality of activities and services provided at the established centres like the EDCs.

#### **1.4 RATIONALE**

In 2007, Nieuwenhuis conducted an investigation into EDCs in Mpumalanga investigating their overall value and effectiveness ascertaining whether their work aligned with the espoused vision and mission. The role of EDCs, as previously noted, is to support the professional development of teachers and improve the quality of education. Taking cognisance of Nieuwenhuis's study and his recommendations to invest in EDCs to support learning activities for the professional development of teachers, this study sought to narrow its focus specifically to the provision and implementation process of EDC activities and services to enhance the quality of teaching and thus the quality of education.

One of the major shifts that have taken place in the field of educational changes is the realisation that professional development to support teachers in their day-to-day practices is problematic (Randenbush, 2005) in that these programmes need teachers to engage in their already busy schedule. The reality is that teachers will need additional time on their work hours for professional growth and collaboration if they are to embrace professional development. In addition to creating ways to carve out time for professional development, the education system must explore the technological ways to support and broaden teaching and learning communities to help teachers make better use of their time. Through a range of technologies, for example, the Internet, teachers can access content knowledge and strategies to implement the curriculum and participate in a network of educational reform without spending time and money for travelling.

Many teachers work tirelessly without appropriate and adequate material and resources. Such teachers find themselves loaded with work, frustrated and de-motivated. This result in teachers leaving the profession with concerns that the curriculum is too demanding and there is limited support available to them. Sir Michael Wilshaw, in the Press (15 January 2014) reiterates that inadequate support and poor teacher training contribute to teachers leaving the

profession. Schleicher (2011) posits that teachers have to be continually developed to be effective in their profession. For this reason, teacher professional development programmes need to increase SCK as well as PCK and in turn have a positive effect on teacher retention and morale, and raise the status of the profession. This responsibility calls for a clear definition and purpose of professional development (See Section 1.9) which leads to specific functions and appropriate selection of activities and services to assist teachers.

Furthermore, there should be a clear relationship between the education reform and teacher professional development. One aspect of this evaluation is to consider how activities and services fit into an overall professional development plan. Steiner (2004) asserts that activities serve different purposes and can be used at different stages of professional development. For example, workshops are best used to help develop awareness of concept in the beginning of a change process while case study is used when teachers have already implemented the strategy. The merit of professional development activities largely depend on its design. It is therefore imperative to evaluate the extent to which the different types of activities and services are effective.

## **1.5 PURPOSE OF THE STUDY**

The EDCs were primarily established to support teacher development, in other words, to provide teachers with the opportunity to engage in quality activities and services to broaden their knowledge and skills. From this stance the study answers questions of: what activities and services provided at the EDCs and what is their quality, how are the activities and services presented, on what context are the activities and services provided and how are these activities and services perceived by the target group.

This study, therefore, sought to investigate the provision and management of EDC activities and services and explore the extent to which teachers perceive the EDC activities and services in relation to their professional development. Given the right conditions which includes material, training, space and equipment, Nieuwenhuis (2007) has argued that an audit be taken to determine the needs of each EDC and re-conceptualising the resource function of EDCs be taken to enhance teacher development.

Thus, this study sought to explore:

1. *Organisational support and changes that increase the value of organisational processes and ensuring that the activities and services support its vision and mission.*

The support of teachers is critical to the success of a change effort. The evaluation identified factors that support change and those that impede an effort to change. To do otherwise would compromise the organisational value and lower the change effort. In addition, teachers affected by change effort must exhibit acquired knowledge and skills.

2. *The participant's learning and use of new knowledge and skills involves selection of quality activities and services appropriate for teachers' needs.*

Evaluation focuses on measuring the extent to which teachers are afforded an opportunity to be actively involved in the learning, practising and reflecting on their knowledge and skills. Ingvarson, Meiers and Beavis (2005) assert that professional development activities should be selected from a variety of strategies to promote professional learning. Evaluation focused on the nature of the activities and services offered to teachers to enhance teacher practises.

3. *Teachers' reaction reflects how teachers perceive the EDC activities and services.*

This level assessed the teacher engagement and interest with the EDC activities and services to inform planning and development for appropriate activities and services to meet teachers' needs.

Patton (2008), contends that evaluation of activities and services play at least two roles, namely, promoting continuous improvement and ensuring accountability and sustainability. Promoting improvement includes more than the quantifiable gains in service output, it includes anything that enhances the sustainable quality of the activities and services for the EDCs, including service quality, relevance and efficiency.

## 1.6 RESEARCH QUESTIONS

The following main research question guided this study:

***How do EDC activities and services in Mpumalanga  
enhance teacher professional development?***

To assist in operationalising the main research question, the following four sub-questions were developed:

*1. What professional development activities and services do EDCs provide?*

This sub-question sought to identify the activities and services that are offered at the EDC and identifying the approach and processes in which these activities are implemented. Evaluation focused on the appropriateness and sufficiency of activities and services.

*2. What is the rationale behind the development of EDC activities and services?*

This sub-question sought to explore the originality and underlying principles through which EDC activities and services were designed. The key performance indicators were evaluated against the element of compliance to the EDC vision and mission. Furthermore, different factors were assessed in terms of providing appropriate and sufficient support to effect change to teacher practices. For example, EDC resources and equipment were evaluated against the element of sufficiency and efficiency to ensure that the input into the programme was appropriate to the output.

*3. What is the quality of EDC activities in relation to the professional development of teachers?*

The intention in this sub-question was to evaluate the content of the EDC activities in providing teacher professional development. The key focal point in this sub-question is the relevancy of the EDC activities and services. Evaluation focused on the teachers' learning process while the key aspects for effective professional development activities are those identified by Haslam (2008) and Guskey (2000). These aspects are centred on the nature of the activities and the processes involved during the implementation of the activities in relation to enhancing knowledge and skills.

#### 4. *What are the teachers' perception of EDC activities and services?*

This sub-question sought to address the attainment of new knowledge and skills. Evaluation elements included teacher mastery of new knowledge and skills, changes in behaviour and the possibility of knowledge transferability. Further elements evaluated include teacher attitudes towards the different activities and the extent to which they rate the significance of the EDC activities. The study was narrowed to the knowledge and skills attained at the short-term outcome level.

The assumptions were that teachers' perceptions yielded useful information about the nature of professional development and that knowledge and skills gained were likely to be applied in their teaching practice. Evaluation focused on rating teacher perceptions of the extent to which the professional development programme met their individual needs and the usefulness and relevance of the professional development programmes to their teaching practice.

### **1.7 AIMS AND OBJECTIVES OF THE STUDY**

This study aimed to offer new evidence with reference to the extent to which EDC activities and services enhance teacher professional development. Furthermore, the study explored the management and implementation of EDC activities and services that support professional development.

The specific objectives of the study were formulated as follows:

- to identify the activities and services offered at the EDCs;
- to determine the underlying principles through which the activities and services are developed and explore the EDC context;
- to assess the content of EDC activities and services and
- to assess teacher perception towards EDC activities and services.

### **1.8 SIGNIFICANCE OF THE STUDY**

Emphasis on the quality of activities and services is needed to guide education reform with greater effectiveness on professional development programmes. Many professional development programmes have been grounded by exaggerated claims of success due to the lack of better or timelier evaluations of the implemented programmes. The results of this



study will provide designers for professional development programme with improved initiative programmes and the creation of appropriate structural professional development evaluation.

Curriculum developers as well as other potential users of EDCs need accurate information about the conditions of effectiveness, selection of resources, identification of appropriate activities and services and a guide to programme planning and evaluating. The framework used in this research provides a clear guide in programme planning and evaluation. This research may assist in promoting and enhancing quality in professional development programme. Given the innovativeness of the process evaluation, it will be useful to examine the innovations in terms of the phases that the study framework evaluated, namely: the input, output and outcomes.

In the end professional growth for teachers would be the result. The findings of this study may contribute to an emphasis on collaborative planning to professional development practices. Often professional development programmes are designed without consultation or lack of concern for productivity just because ‘it has always been done like that. Programme outcomes should yield its merit and shows that it makes a difference in the education system.

## **1.9 RESEARCH DESIGN AND METHODOLOGY**

This study employed a qualitative mode of inquiry that has the ability to use multiple data collection tools and an interpretive approach that uses qualitative methods to explore and understand all events from the perspective of the participant’s experiences (Hatch, 2002). The strength of employing a qualitative research approach is on uncovering more about people’s experiences while collecting data from a small group of people (Patton, 2008) and this results in providing a holistic picture of a setting.

Qualitative methods (see Chapter 3 Section 3.3) are useful in evaluating programmes that match services to the specific needs of the participants. Therefore, this study used process evaluation (see Chapter 3 Section 3.2) as a qualitative method to establish whether activities and services were implemented as planned. Apart from the fact that qualitative evaluations often report participants’ experiences in their own words, they also gain strength from four specific sources: describing the engagement of teachers, capturing teachers’ experiences and

perception, examining the different types of activities (Lewis-Beck, Bryman & Liao, 2004) and finally, exploring the role played by centre managers to support the EDCs and effect changes.

The study opted to conduct an in-depth qualitative evaluation of activities and services in two purposively sampled EDCs taking Singleton and Straits (1999) warning that attempts to observe all cases may actually describe a phenomenon less accurately than a carefully selected sample of observation. A total of 20 participants were purposively sampled, comprising of two EDC managers for both centres, two subject advisors one for Computers in Education and one for Physical Sciences and sixteen teachers participating in either or both programmes identified in both EDCs.

Several methods of data collection (see Chapter 3 Section 3.5) aligned to programme evaluation were adopted for this study. Semi-structured interviews with the sampled centre managers and subject facilitators were conducted to elicit rich data on the nature of activities and services they provide and the contextual setting (Sarantakos, 2005 and Bazeley, 2006). A questionnaire that comprised both open-ended and closed-ended questions would give much information on teacher experiences and perceptions if participants were located in a wide geographic area (Fowler, 2002). It is important to note that despite the study being qualitative, questionnaires can be incorporated into a qualitative research design to collaborate or elaborate on the meaning of teacher responses (Maxwell, 2013). This is elaborated in Section 3.5.2. In addition, the researcher kept field notes to record all forms of descriptive notes written while in the field including events and the location of EDCs (Bogdan & Biklen, 2003) and also kept a personal journal to record personal reflections during the process of data gathering (Yin, 2011).

Data analysis (Chapter 3 Section 3.6) was an on-going process while the study was in progress (Patton, 2002). An inductive method was used to develop themes from the collected detailed information. Patterns were further identified to draw comparisons with examples found in the existing literature on teacher professional development (Punch, 2005). Although some of the data generated may be quantifiable, the bulk of the analysis was qualitative in nature (Maxwell, 2013).

This study was granted ethical clearance by the University of Pretoria as well as the Mpumalanga Department of Education. Consent was also received from all participants and they were treated with respect.

## 1.10 DEFINITION OF KEY CONCEPTS

This section provides the definition of terms used in the context of this study: Education Development Centres (EDCs), quality, professional development, efficiency, sufficiency and effective/effectiveness.

- **Education Development Centres (EDCs)**

These are centres established to increase access to the relevant and appropriate development programmes and support in response to the expressed needs of teachers. These centres embrace a holistic and participatory approach to sustaining the further development and empowerment of teachers providing them with the skills necessary to manage quality teaching in the classroom. Often these non-profit making centres create learning opportunities for teachers. The literature uses other names for such an institution such as ‘teacher centre’ interchangeably with teacher resource centre (TRC), National Centre for Teacher Development (NCTD) and Education Development Centre (EDC), the preferred term used in South African education policy documents.

- **Quality**

Quality in this study refers to the degree to which the activities and services meet teacher expectations and it is defined as a function of competencies in terms of knowledge and skills (Sharma & Kamath, 2006). In this dissertation, quality refers to quality activities and services that embrace the relevant content reflected for the acquisition of basic skills and knowledge. The literature suggests that quality input produces quality output, which means that quality activities and services produce quality content, quality processes, quality outcomes, a quality learning environment and quality teachers.

This study seeks to explore the qualitative nature of EDC activities and services that embrace a system of teaching and learning to produces competent teachers who can face challenges in their teaching practices.

- **Professional development**

Professional development refers to the acquisition of skills and knowledge for personal growth and career advancement. This study focused on the regular opportunities and experiences created and the provisioning of a series of activities and services to promote growth and development in the teaching profession.

- **Efficiency**

Rossi, Lipsey and Freeman (2004) define 'efficiency' as the extent to which an activity achieves the specified goal whilst minimising resource usage. It is often associated with the measure of the resources used in terms of costs to achieve intended goals. This definition has led to the evaluation of the appropriation of specific measurable indicators within the input aspect in relation to the output aspect (Figures 2.4 and 2.5). The identified measurable indicators cover financial support, time and workshops.

- **Sufficiency or adequacy**

The most reliable indicator of evaluating effectiveness is sufficiency or adequacy. This study evaluated the sufficiency of resources to support the professional development.

- **Effective/Effectiveness**

An activity or service is deemed effective when it achieves the intended outcome. The EDC activities and services are expected to enhance content knowledge and skills of those engaging with them, specifically the teachers (Carter, 2008). The criteria used in this study for effective activities relate to the potential outcomes of the training sessions. Evidence of effectiveness reflected the mastery of new knowledge and skills.

The study focused on teacher reaction to the activities and services as the output indicators while the acquisition of specific skills and behavioural changes are the outcomes.

## **1.11 ORGANISATION OF THE THESIS**

This dissertation comprises of five chapters.

**Chapter 1** provides a comprehensive overview of the study. It includes the identification of the research questions, the hypothesis, aims and objectives of the study. The research design

briefly outlines the site of research, the sampling of participants, data collection and analysis. Lastly, the general study outline is presented.

The essence of **Chapter 1** was to:

- demonstrate the motive behind the identified topic;
- express the significance and relevance of the topic;
- put across the research questions relative to the aims and objectives of the study;
- present the research design and methodology followed in conducting the study; and
- outline the research procedures.

**Chapter 2** presents the critical synthesis of a literature review in understanding the concepts and what has been done relative to what needs to be done in relation to the quality activities and services in EDCs. This review provides background on:

- the concept of quality activities and services, teacher centres and professional development (Section 2.2 - 2.3);
- examining the conditions of teacher learning (Section 2.4);
- identifying key features for effective professional development activities and services ( Section 2.5); and
- outlining the conceptual framework for the study (Section 2.6).

The main purpose of the literature review was to establish the conceptual framework for the study and identify a model for the evaluation that was used to highlight gaps that the study intended to fill.

**Chapter 3** outlines the research design and methodology used in collecting data from each of the data collection techniques used and the sampling techniques applied to select participants.

The essence of this chapter was to:

- discuss and describe the research design (Section 3.2);
- provide background information about the methodology followed in the study and the development of instrument (Section 3.3 – 3.6); and
- elaborate on the element of trustworthiness and ethical consideration (Section 3.7 and 3.8).

**Chapter 4** presents the findings and interpretation of the data collected. The purpose was to provide detailed analyses of the data from the field notes with reflective diary entries from interviews and open-ended teacher questionnaires.

The main essence of this chapter was to:

- present the findings obtained;
- identify trends and patterns in the data with reference to the research questions; and
- interpret the findings and establish strengths and weaknesses of the study.

**Chapter 5** finally provides a summary with regard to the research questions and demonstrates whether the research aims and objectives have been met. The chapter concludes by giving recommendations and possible related themes for further research.

Chapter 5 further sought to:

- provide a summary of the research design (Section 5.2);
- provide possible answers to the research questions (Section 5.3);
- provide an outline on how the conceptual framework assisted in the evaluation of the activities and services (Section 5.4);
- provide a summary of the research design and methodology (Section 5.5); and
- provide possible recommendation (Section 5.6) and conclusion of the study (Section 5.8).

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

The quality of the activities and services offered at an Education Development Centre (EDC) plays a fundamental role in the provision of professional development for teachers. This chapter uses the term ‘teacher centre’ as a term mostly used in the literature. The Mpumalanga teacher centres, as is the case with other centres, have documented different functions to adhere to as stipulated in its vision to support teacher professional development. Where an education system is fragile and possibilities for teacher professional development are very weak, a far more centralised model of teacher professional development is called for (Mundry, 2005). Therefore, the potential effectiveness of teacher centres (Johnson & Maclean, 2008), is regarded as sound if its organisational structure has well, planned professional development programmes to support teacher development.

This chapter highlights specific arguments and ideas regarding the quality of teacher centre activities and services in relation to teacher professional development. The literature review seeks to document information about the organisational structure of teacher centres to find the basis on which activities and services are developed, the quality of the activities and services that would yield effective professional development and teacher reaction to the activities and services offered. The literature further looks at evaluation as means to examine the teacher centre activities and services.

This chapter therefore seeks to:

- provide insight into the characteristics of quality activities and services (Section 2.2);
- address the nature of teacher centres focusing on the role and function of teacher centres and examine the concept of professional development (Section 2.3);
- draw on the conditions needed for teacher learning to meet the levels of effective professional development and specify the factors that impede professional development (Section 2.4);
- discuss features for effective professional development (Section 2.5); and

- discuss the development of a conceptual framework to guide the data gathering process (Section 2.6).

## 2.2 CHARACTERISTICS OF QUALITY ACTIVITIES AND SERVICES

According to Rosemary, Roskos and Landreth (2007), quality teaching is essential to all education reforms and De Vries, van Keulen, Peters and van der Molen (2011) further assert that the quality of professional development activities and services is the key to educational improvement. Activities and services are said to have quality if they enhance an individuals' knowledge and skills in such a way that duties are performed effectively and proficiently (Villegas-Reimers, 2003; Sharma & Kamath, 2006). Laine (2011) posits that quality activities and services should embrace relevant content to achieve several goals that would:

- improve and increase teachers' knowledge in their teaching subject specialisations;
- improve classroom management skills;
- form an integral part of educational improvement in schools and the district educational improvement;
- advance teacher understanding of effective instructional strategies; and
- provide opportunities for participation.

The literature (Rosemary, et al, 2007) defines teacher's knowledge in terms of the subject content and Laine (2011) reiterates that the content of the activities is the critical element to be assessed to ascertain effective professional development. It is imperative that knowledge and skills be updated in the light of the educational reform needed for teachers (Schleicher (2011) to be relevant to the current changes that have been made to implement new strategies concerning the current curricula and to help teacher become more effective.

However, Jurdak (2009) argues that the quality of the activities does not reside in the quality of its output, input or process but rather to the extent of the responsiveness to which the activities as a whole address and adapt to emerging needs, transforming them into a new system. Sharma and Kamath (2006) share this view that for quality activities and services to produce quality outcomes, the content, processes and learning environment too should also be of an appropriate quality.



## **2.3 THE CONCEPT OF TEACHER CENTRES AND PROFESSIONAL DEVELOPMENT**

The teacher centre setting provides teachers with an opportunity to reflect on what they learn and how they construct their understanding of the classroom context. This section therefore reveals how teacher centres enhance teacher professional development (Siddiqui, 2008) through the provision of activities and services.

### **2.3.1 The Function and Use of Teacher Centres**

The concept of teacher centres was initially criticised as having too little impact on classroom practices but served as a facility for the storage of material and resources (Johnson & Maclean, 2008). The debates centred on different interpretations of their role and mode of operation (Hoppers, 1998). Ultimately, a number of ideas came to focus on upgrading teachers and increasing their professional status. Though the role of teacher centres was constrained by various factors, including a poor monitoring system in some countries the name of the centres was based on the conception for which it was established.

The primary motive for the establishment of teacher centres was to provide practising teachers and other partners in education common space to diminish their isolation. Hoyle and Megarry (2006) regard teacher centres as a social place for teachers where they would have a choice of resources and consultative services regarding their needs. Teacher centres provide teachers with an opportunity to reflect, share understanding and ideas and make decisions. English and Wilson (2004) assert that it is through such communication that teachers expand their thinking and understanding.

One of the roles of teacher centre is to motivate teachers and lead them to real engagement through an array of activities and services (English & Wilson, 2004). The nature of activities provided determines the success of the teacher centre. According to Siddiqui (2008), teacher centres should be conceptualised not institutionalised. This means that the teacher centres should provide quality activities and services to bring about change in teacher practices and should eventually aim to ensure teachers' voluntary and cooperative participation.

Most teacher centres were established for specific purposes, some of which, according to Siddiqui (2008) and Ansell (1998) are:

- to promote professional competence among teachers through long and short in-service educational programmes;
- to serve as educational resource and guidance centre for the catchment area of schools;
- to work as social centre for the working professionals of the area;
- to promote quality of education through display of educational material and producing educational material.

Siddiqui (2008) identified several factors that inform the choice of objectives in each centre: the conditions of the centre, the needs of teachers in the area and the resources accessible to a particular centre. After identifying appropriate objectives, the centre then formulate functions to achieve the specific objectives set, namely; social or community centre, curriculum development, resource centre, exhibition centre, computer centre, science focus centre or language centre and they are briefly discussed below.

#### **2.3.1.1 Collaborative Space**

The first and most basic condition of establishing a teacher centre was to create a space for teachers to congregate and to meet freely to discussing common strategies. However, for the centre to qualify as a teachers' centre, a layout of the requirements needs to be laid down. Siddiqui (2008) as well as English and Wilson (2004) assert that teachers need a central place away from their own setting to collaborate, share ideas and experiences and take part in different activities.

#### **2.3.1.2 A curriculum development centre**

From the debate on the functions of teacher centres, an agreement to provide professional services to teachers was reached (Mbambo, 2009), while offering a place where teachers could discuss curriculum challenges and the improvement of teaching. It is through the sharing of ideas, combating isolation and fostering cooperation between schools, as well as collaboration among teachers and principals, that learning is effective, and follow-up visits to

schools for additional support are also needed. To avoid providing merely generic courses for all teachers, specific needs have to be identified through the involvement of teachers. According to Hardy (2012), this approach limits the top-down design of development programmes which, in turn, promotes ownerships.

Evaluation of the effectiveness of teacher centres as a strategy for curriculum development reveals many challenges. Knamiller (1999) and Diaz-Maggioli (2004) found obstacles to professional development programmes in incompatible curricula, inadequate material or facilities and poor support from management. Financial challenges to sustain centre training became the major challenge in many instances. Workshops at teacher centres involve training on teaching strategies, management and administrative duties, the use of computers in accessing related programmes and creating motivated and responsible teachers.

### **2.3.1.3 Resource centres**

The primary role of resource centres was to house resources (Hoppers, 1998), to provide teachers with a range of equipment for loan and use. Siddiqui (2008) asserts that minimal equipment and material is necessary to open up a resource centre, as more will be acquired gradually as the centre grows. Books on educational methodology, teacher guides and subject reference books remained the core type of material used at the centre. However, the selection of appropriate books for the curriculum was problematic. The Department for International Development [DFID] (1998) recommended that resource centres should display published and approved textbooks and readers from which teachers would make a selection. As a result, teacher centres in Zambia provided opportunities for publishers to advertise and sell their books. A unique contribution to be made by resource centres was to provide a training course on the use of the textbooks and/or educational material.

Furthermore, resource centres were established to enable teachers to develop their own teaching and learning material (DFID, 1998), for this reason, they were equipped with duplicators, scanners, chart papers, computers and other frequently used classroom material, not easily accessible in schools. However, there is little evidence that teachers actually used these resources to create teaching and learning material. If they were to be used effectively, imaginative teachers who develop resources could be identified, supported and their contributions used as models. Centre managers could duplicate and circulate their material or

even sell copies to schools, allowing for a sharing of otherwise limited resources. Siddiqui (2008) asserts that resource centres are allowed to subscribe to educational journals or magazines to provide teachers with education information on the new curriculum and other items of general educational interest.

#### **2.3.1.4 Exhibition centre**

Teacher centres are often used to display material and work produced by children from different schools, books and material from different publishers and educational equipment produced by manufacturers. Teachers can then go around and view such displays when they visit the centre. The centre can also screen educational films (Ansell, 1998).

Nonetheless, Siddiqui (2008) notes that a multipurpose centre could be used for numerous functions such as; workshops, display exhibitions, meetings and group discussions with additional rooms for storage and offices. In contrast, purpose-built centres, such as a computer centre, are established with the intention of having a clear focus on specific objectives. However, having a purpose-built centre seems to be a great challenge considering the number of centres that need to be established and the choice of location where they should be built.

In Japan, a National Centre for Teacher Development (NCTD) was established to provide direct teacher training, obliging teachers to take on-the-job training to continually improve their qualifications and the educational standard of the nation. On the other hand, Mpumalanga province policy administrators opted to name their teacher centres as EDCs, after reviewing the role and functions of such a centre.

### **2.3.2 The Concept of Teacher Professional Development**

Most educational systems have acknowledged the importance of professional development and have supported initiatives towards improving professional skills and knowledge of teachers. This exercise helps teachers improve classroom practices. Villegas-Reimers (2003), regards professional development as a development of a person in his or her own professional role. Due to the increase in the need for teacher growth, professional development has now

projected a new image of teacher learning, one that is considered as a continuous process that includes regular opportunities, planned systematically to promote growth and development in the teaching profession (Guskey, 2000, Scheerens, 2010 & Villegas-Reimers, 2003).

Thus the focus of professional development is threefold, namely to provide:

- Activities that develop the individual's skills, knowledge, expertise and other characteristics as a teacher (OECD, 2009);
- A systemic process that assesses the degree to which professional development shifts classroom practice;
- Direct impact on student learning, achievement or engagement.

In summary, effective professional development must cover all three aspects: knowledge and expertise, classroom practices and impact on student learning.

### **2.3.2.1 Characteristics of teacher professional development**

The literature suggests that teacher professional development should provide opportunities for learning on all levels and address teacher-learning needs (Guskey, 2002). To this end, teachers' individual needs should combine with the district's and school's needs. Need-based activities helps bridge the gap between the learning environment and day-to-day teaching practice. Moreover, Hunzicker (2010) asserts that activities should be designed to address both the personal and the professional needs.

Hunzicker (2010) identifies quality activities as those related to teacher practices. Teachers perceive professional development activities as relevant and authentic when there is a connection between what the teachers learn and classroom activities that ought to be done. Teachers are encouraged to reflect on their learning and give feedback to develop change in their teaching practices. Regular feedback assists programme designers to align their activities objectively. De Vries, et al. (2011) believe that the teachers' perceptions and views, as part of the feedback should be regarded as important when designing professional development activities to influence their behaviour.

Unlike teacher training, which consists of a finite procedure and staff development<sup>2</sup>, professional development is part of continuing teacher education and contributes to the

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<sup>2</sup> A set of 'one-size-fits-all' activities in which someone (top-down) decides what teachers need to know.

process of teacher growth. There is an implicit understanding that professional development does not stop when a certain skill has been mastered or achieved (Richard & Farrell, 2005; Villegas-Reimers, 2003; Guskey, 2000), but rather it is perceived as a long-term process (Craig, Sullins, Witherepoon & Gholsohn, 2006; Hakel & Halpern, 2005; Belar, 2012).

According to Richard and Farrell (2005), the need for on-going renewal of professional skills and knowledge is not a reflection of inadequate training but simply a response to the belief that not everything teachers need to know is provided at pre-service level, particularly as the knowledge base of teaching is constantly changing.

Professional development takes place within a specific setting or context that supports it (Scheerens, 2010). The most critical part of professional support should probably come from the centre administrators, as they have a strong need to bring change to teacher practices. In this way, they will make the context conducive to the changes that professional development is designed to bring. The context provides the basis and support for a programme that is sustainable, while contextual aspects that can be controlled include its vision and mission, personnel and process to guide and deliver teacher professional development, a person to manage it, trainers and professional developers.

### **2.3.2.2 Objectives of professional development**

To improve teacher quality, teachers on job should continually be refreshed in their subject content knowledge and retrained on the developing strategies of teaching (Siddiqui, 2008). The primary objective of teacher professional development is to improve teacher performance in the local context, particularly with regard to classroom practice. Specific objectives, as seen by Ono and Ferreira (2010), are to:

- enable teachers to apply new teaching strategies and understand the principles of their pedagogy;
- empower teachers to deal with the subject matter content and have the knowledge of what should be covered in their daily teaching;
- strengthen teachers' professional identity and help them develop more positive attitudes and confidence;
- provide opportunities for growth, exploration, learning and development so that they do their own reflective practice and recognise their own work as professionals;
- develop the ability to use instructional material; and

- revitalise the teaching profession and its members.

The assumption is that the knowledge that teachers gain from professional development programmes should equip them with knowledge of theoretical and practical aspects of the subject they have to teach (Villegas-Reimers, 2003).

## **2.4 ADDRESSING THE CONDITIONS ON HOW TEACHERS LEARN**

Recent studies (Ball & Cohen, 1999; Putman & Borko, 2000) suggest that teachers' learning occurs in individual and interpersonal realms. Individually, teachers gain knowledge and content and decide on the implementation of that knowledge while in the interpersonal realm, teachers engage in collaboration (Villegas-Reimers, 2003) with other colleagues to explore and develop their own learning. Bell and Gilbert (1994) maintain that teachers are viewed as learners, seeking their own development in relation to their classroom environment, which changes the on-way movement of information transfer (Day & Sachs, 2004). Teachers believe that support should not be limited to workshops and short courses, but they would appreciate individual support to discuss challenges they encounter in their own respective school.

Guskey (2000) discusses the levels of effective professional development (Table 2.1) which can be used by evaluators to collect and analyse data. Effective approaches to professional development reflect what we know about learning, our current knowledge and skills together with sufficient learning about and reflection on teacher classroom practices.

### **Level 1: Participants' reactions**

This level assesses teacher's responses and experience of the professional development activities. However, since information is collected from the participants through a questionnaire or survey, it tends to be highly subjective. Mooney & Mausbach (2008) assert that a high degree of satisfaction with a question means that participants liked the learning experience. Questions at this level focus on participants' satisfaction and assess whether their needs were met. The questions concern three issues: content, process and context.

**Table 2.1: Five levels of professional development**

Evaluation level	Questions asked	Ways of gathering information	Elements to be measured	Use of information
<b>Participants' reaction</b>	Time well spent Material relevant Facilitator knowledgeable Room right temperature Chairs comfortable	Questionnaires	Satisfaction with experience	Improve the programme
<b>Participants' learning</b>	Acquisition of intended knowledge and skills	Demonstration Simulations Participants reflection Participants portfolios	New knowledge and skills	Improve programme content, format and organisation
<b>Organisational support</b>	Implementation supported problems addressed quickly and efficiently Recognition of successes Impact of the organisation	District school records Minutes Questionnaire Structures interviews Portfolios	Organisational support, accommodation, facilitation and recognition	Document and improve organisation support Inform future change
<b>Participants' use of knowledge and skills</b>	Effective application of new knowledge and skills	Questionnaires Structured interviews Participants reflections Portfolios Video or audio tapes Direct observation	Degree and quality of implementation	Document and improve implementation of programme content
<b>Student learning</b>	Impact on student Effect on student performance Influence on student well being Confidence attainment Attendance improvement	Student record School records Questionnaire Interviews Portfolios	Outcomes Cognitive – performance and achievement Affective -attitude Psychomotor – skills and behaviour	Improve all aspect of the programme Demonstrate impact of professional development

### **Level 2: Participants' learning**

This level assesses new knowledge acquisition as the outcomes result in relation to the participants' expectations. Day and Sachs (2004) distinguish between the types of learning outcome from professional development as: cognitive, affective and behavioural. Mooney and Mausbach (2008) suggest questions addressing what participants want to learn. This level is conducted after reflections and analyses against the organisational objectives.

### **Level 3: Organisational support and change**

This level, focuses on the capacity of the organisation to support and influence change. Mooney and Mausbach (2008) emphasise the importance of identifying the organisational



support system and factors that impede the implementation of professional development. Professional development activities tend to be transferrable in a supportive organisation. Aspects that are likely to be assessed at this level are organisational effectiveness; alignment of the programmes with organisational policy; organisational support from leadership; and organisational barriers to the successful completion of the programme. However, political and organisational issues tend to cloud assessment at this level.

#### **Level 4: Participants' use of new knowledge and skills**

The evaluator at this level assesses whether teachers are implementing what they have learnt in their teaching practice. Evaluation should take place in the real classroom situation after teachers have reflected on the knowledge acquired. Well-defined indicators are needed to measure the transferability of knowledge. Mooney and Mausbach (2008) believe that classroom practice determines the effectiveness of the professional development training offered.

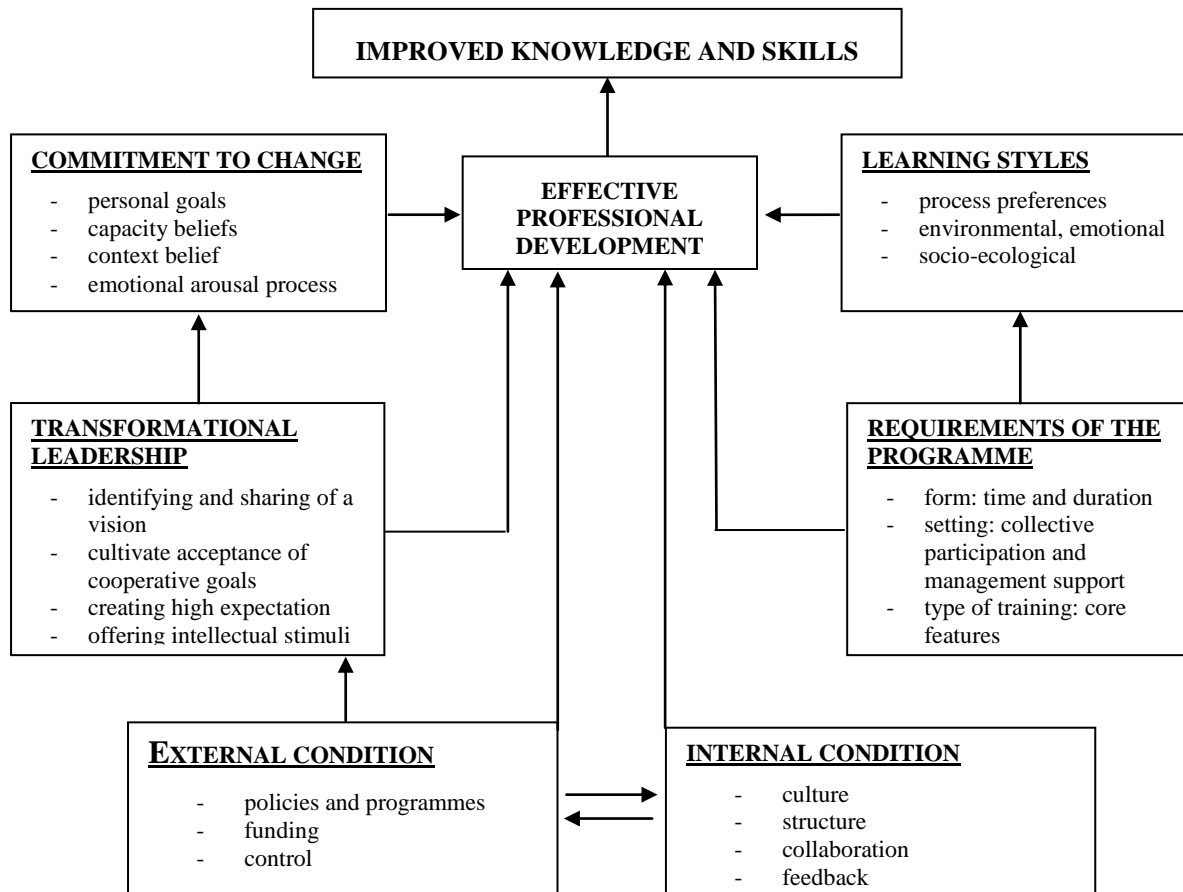
#### **Level 5: Student learning outcomes**

Assessment at this level focuses on learner achievement. This level matches student learning with teacher practice; if student' achievement is poor, then teacher practice needs improvement. However, evaluators should also look into other factors contributing to the poor student performance rather than depending on assessments or national tests.

However, the levels are accompanied by few implications. Information gathered at each level should be treated independently from each other as it provides independent data to improve the quality of the professional development programme. This suggests that it is not possible to link the impact of one level to the previous level. On the other hand, Mooney and Mausbach (2008), argue that planning professional development to improve learning is like developing a logic model that starts working from the outcomes working backwards. This is based on the assumption that the decisions made at each level affect the rest. Put differently, the policies and practices implemented influence the organisational changes needed.

## 2.4.1 Factors influencing Professional Development

Considering the different views in the literature on the concept of professional development, Steyn (2005) came up with guidelines for planning and implementing professional development programmes that may enhance teacher professionalism (Figure 2.1) and provides an outline of some factors that may influence the implementation of these programmes.



**Figure 2.1: Factors influencing professional development**

Source: UNISA. Implementing Professional Development in Invitational Education (2005)

A description of Figure 2.1 is as follows:

- *Learning styles of teacher:* It is imperative that teachers be considered as individual beings with different learning styles. Often teachers are comfortable to participate in a programme that covers their learning styles. This condition motivates teachers and allows for the acquisition of more skills.

- *Teacher commitment:* Educators play a critical role in shaping their own programme of development. Without the teachers' commitment, the success of professional development is not possible.
- *Leadership:* Transformational leadership that could influence teachers positively towards accepting effective development is critical. Leaders must be creative in identifying and sharing a vision and creating high performance expectations that form the quality of selected activities.
- *Internal conditions:* The staff at the centre should acknowledge collaborative teamwork as being of greater benefit. To achieve this, professional development should be on going and provide feedback.
- *External conditions:* Conditions outside the organisation influence professional development. The conditions may include the nature of top-down programmes, general organisational structure, available resources and equipment and, financial support.
- *Requirements of programmes:* Certain key features that allow for the effectiveness of professional development are important such as: the form the programme adopts the time when held and its duration, collective participation, cooperative support, content focus, active learning opportunities and coherence.

#### **2.4.2 Forms of Professional Development**

To promote teacher development, Gaible and Burns (2005) have identified three forms of professional development (Table 2.2):

Professional development in a standardised form is commonly used especially to introduce concepts or policies. This form of development seems to be the best and is a fast cascading model to impart awareness of information to a large group of people. A small group of experts is trained in a centralised venue to further cascade the information to colleagues. However, incorrect information could be cascaded if less experienced trainers are used.

**Table 2.2: Forms of Teacher Professional Development (TPD)**

	<b>Standardised TPD</b>	<b>Site-based TPD</b>	<b>Self-directed TPD</b>
<b>Description</b>	Centralised form of TPD used to disseminate information and skills among a group of teachers, focusing on exploration of new concepts in a workshop or training sessions	Intensive learning by group of teachers promoting long-term changes, from local facilitator often in schools or resource centres with special focus on situational problems that individual teachers encounter	Independent learning initiating own professional development
<b>Advantages</b>	<ul style="list-style-type: none"> <li>- Build awareness</li> <li>- Cascading model – small group receive intensive training to further provide training to their peers.</li> </ul>	<ul style="list-style-type: none"> <li>- Many teachers reached in one training</li> <li>- Teacher communities established</li> <li>- Flexible</li> </ul>	<ul style="list-style-type: none"> <li>- Teachers become models of life-long learners</li> <li>- Teachers seek out advice from experienced colleagues or the Internet</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>- No ongoing support</li> <li>- Trainers given to less experienced trainers</li> <li>- Loss of complex information</li> </ul>	<ul style="list-style-type: none"> <li>- Time and labour intensive for facilitators</li> <li>- Establishment and maintenance of network facilities</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of support or guidance</li> <li>- Lack of collaborative support</li> <li>- Little or no feedback</li> </ul>

Gaible and Burns (2005) also present site-based professional development in which intensive training is given by a local facilitator to a group of teachers. Although this form of training is time consuming and labour intensive on the part of the facilitator due to the use of follow-up training, many teachers benefit from the flexibility of such a programme.

The third form of professional development is the self-directed approach. This form of development promotes independent learning wherein, the teachers seek advice from experienced colleagues on their own or access it from the Internet. However, this form of development is criticised based on the lack of support and collaboration. In addition, the individual gets little or no feedback on this type of learning.

In reviewing these forms of professional development, this study seeks to align itself with the site-based professional development mode that focuses on the activities organised at the teacher centres for different groups of teachers with special reference to the situational problems that individual teachers encounter. Professional development is defined as a series of activities that develop an individual's skills and knowledge (Guskey, 2000) organised in a centralised venue. Although the functions of teacher centres differ, their overall role is to support teacher professional development (Hoppers, 1998).

### **2.4.3 Factors Affecting the Process of Professional Development**

Teacher professional development has as its core the improvement of skills (Villegas-Reimers, 2003), however, Diaz-Maggioli (2004) and Rodrigues (2005) note that even if there has been significant investment in professional development little change has been noted in real practice. However, it is important to reposition professional development so that the collective efforts of teachers and administrators result in quality education for all. Diaz-Maggioli (2004) and others have found a number of constraints associated with professional development. Examples are; once-off workshops, one-size fits all presentations, little or no modelling of what is being taught, top-down decision making, lack of follow-up support, lack of variety in the delivery of professional development and inaccessibility of professional development opportunities. This study discusses a few of these factors.

#### **(i) Top-down decision making**

Often programmes for teacher professional development are designed by administrators and facilitators, leaving the target group out of the planning. Poor involvement of teachers in this stage leads to inactive participation and lack of ownership. Hypothetically, teacher ownership could effect changes in pedagogical content knowledge. In the same way, Rodrigues (2005) noted that administrators forget that teachers have great influence on the effectiveness of the development programmes. Ignoring their contribution reduces professional development to an array of options that do not reflect the teachers' contextual environment (Hardy, 2012).

#### **(ii) Transferring of learnt ideas**

According to Richard and Farrell (2005), techniques taught in professional development programmes should be replicated in the classroom. By the time teachers need to extend the bridge between the theoretical aspect of ideas learnt and putting them into practice they are alone in the classroom with no assistance other than textbooks and possibly some materials. Currently, teachers are known to attend a once-off workshop that rarely helps them integrate new teaching strategies in the classroom.

### **(iii) Lack of variety in the delivery modes of professional development**

Richard and Farrell (2005) spotted a lack of variety in the delivery modes of professional development. The often-used professional development programmes are chosen because of their cost efficiency. Teachers could enrol for a programme that is less expensive regardless whether it is relevant to their needs as teachers or not. Again, when opportunities for professional development exist, teachers who really need specific sphere of expertise, knowledge or skills are left behind new development in that particular field. Rodrigues (2005) asserts that teacher professional development has to be seen as delivering a variety of current themes to the relevant teachers to enhance quality. Programme administrators must constantly review and assess the effectiveness and ability of their programmes to meet the needs of teachers (Rhoton, Bowers & Shane, 2001).

### **(iv) Inaccessibility of professional development opportunities**

Diaz-Maggioli (2004) noted that opportunities for professional development rarely reach teachers. Often when teachers are not involved in the planning for professional development, their needs cannot be met. This results in creating negative attitudes and perceptions as teachers are not attending development programmes or transferring what they ought to have learnt to be up-to date in their field of specialisation.

### **(v) Standardised approaches to professional development that disregard the needs of teachers**

Often professional development programmes do not take cognisance of the different experiences of teachers in a group might have and the fact that this gives rise to a range of needs that have to be met in the programme offered for successful learning for each participant. This problem situation arises when the programmes are designed in a standardised manner in such a way that they not cater for any variations at all. Needs of the full range of participants will therefore remain unfulfilled or only partially met.

## **2.4.4 Activities and Services for Teacher Professional Development**

Professional development programmes should be based on curricular and instructional strategies. Villegas-Reimers (2003) argues that the most effective professional development

is that which relate to the activities of teaching and learning. As earlier stated, such programmes deepen teachers' subject knowledge, sharpen teaching skills, keep up with new developments in education thus generating and contributing to new knowledge in the profession (Scheerens, 2010). However, Scheerens (2010) further comments that teachers are able to play a critical role in identifying what they need to learn and are quite capable of developing a range of teaching and learning activities in the discipline in which they are involved as teachers. Those activities can be formal or informal and can bring about improvement in the profession. Apart from the initiatives provided for professional development, little is known about teacher participation in programme development in the teaching profession.

The National Science Education Standard (1996) and South African Council for Educators (SACE), (2008) put forth the following to explain the relationship between professional development activities and professional learning:

- opportunities for teachers to learn and use various tools and techniques for self-reflection;
- an opportunity to know and have access to existing research and experiential knowledge;
- contribution of activity to improve members competency in professional practice in the field of education;
- duration of an activity; and
- alignment of activity with system needs as indicated by DoE<sup>3</sup> and SACE.

According to SACE (2008), most of the activities for professional development should be based on an inquiry-based approach. In taking teachers as adult learners, activities like case studies, role play and simulations could familiarise teachers with new enquiry ideas and help in acquiring ability to resolve cognitive problems. Steiner (2004) put forward the following teacher centre activities.

#### **(i) Lesson study**

This is a teaching improvement activity in which teachers jointly plan, teach, observe and comment on a lesson that is presented by one of the teachers in a real classroom situation

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<sup>3</sup> The former South African Department of Education (DoE) that in 2009 was divided into two parts Department of Basic Education (DBE) and the Department of High Education (DHE).

while the other group of teachers observe. After discussing their observation and revising the lesson, it is presented for the second time. After the second presentation the group discuss findings again and finally come up with lessons of what they have learnt from the lesson in relation to their focused questions they wanted to explore. Although this activity takes a long time, it promotes teacher collaboration.

## **(ii) Networks**

A variety of communication networks and strategies promotes effective professional development. Teachers must learn to integrate technology into their teaching practices using Information and Communication Technology (ICT). Electronic networking is a powerful tool for teacher professional development. Teachers could access online libraries, list servers and attend to issues like assessment and other education policies.

According to Lasonde and Israel (2010), networking helps teachers in groups to work collaboratively and effectively on line. Teachers with similar interests can work together sharing knowledge and resources. Networking could also serve as an external support for teachers.

## **(iii) Study groups**

This approach helps in bringing teachers together to undergo a group task that is normally done in isolation. The study group concentrates on mutual topics and they meet regularly to plan and conduct collaborative activities. All members benefit from the interaction as each member of the group shares experiences (Cayuso, Fegan & McAlister, 2004). Most study groups are a hands-on form and attempt to meet a teacher's own needs.

## **(iv) In-service training**

Rashidi and Danesh (2011) refer to in-service training as training activities that follow the initial professional certificate, the main aim of which is to prepare teachers optimally to perform their work responsibilities. The training intends to improve professional knowledge, skills and attitudes and, in achieving the goals, the institutions use methods such as case studies or workshop training.



With the increased interest in improving teacher education (Villegas-Reimers, 2003), schools have designed in-service programmes as a way of training their own teachers. This initiative has led to the establishment of central structures to coordinate the training. Villegas-Reimers (2003) note that in-service training was offered at different levels, including at private institutions, colleges, teacher-based groups, and state institutions such as teachers' centres and resource centres. Sustaining the activities conducted at these institutions remained a challenge, though this was eased when some centres began to receive non-governmental financial support.

#### **(v) Workshops**

Workshops are one of the most common and useful traditional forms of professional development activities (Villegas-Reimers, 2003). Richard and Farrell (2005) refer to a workshop as intensive, short-term learning activity designed to provide an opportunity to acquire a specific skill and/or knowledge. They usually consist of a series of activities in which teachers discuss a specified area of concern, learn skills and acquire knowledge that they can apply in their classrooms, reflect on their own teaching practices, and address issues related to individual growth. According to Villegas-Reimers (2003), workshops are arranged for informing, problem-solving and training. They may be content-based, school-based, or infusion workshops. Facilitators include subject advisors, service providers, centre experts and teacher professional bodies.

A facilitator who is recognised as an expert with relevant experience in the workshop topic usually leads workshops. These sharing of knowledge and expertise should be undertaken amongst teachers in a comfortable learning environment (Richard & Farrell, 2005). Apart from being relevant to the classroom, a workshop is intended to enhance teachers' practical skills (applied) and help them solve problems rather than improving only the theoretical (technical) understanding. Well-planned workshops motivate teachers and permit them to share their frustrations, problems and concerns with peers from other institutions in a different forum. In doing so, teachers learn different strategies in the implementation of policies or any changes in the curriculum and thus become innovative. Those who do not have time at their disposal, find short-term workshops helpful, in that they are able to handle specific topics. Villegas-Reimers (2003) noted that teacher cooperation in workshops promotes synergy, and that inputs are debated and the best solution selected. Issues are easy to resolve when experts work together and collaboration increases consensus. The output of

one workshop can be used as input for the next, eventually leading to a series of workshops that build upon on one another. Richard and Farrell (2005) suggested various cooperative learning activities to give teachers an opportunity to absorb new information, participate in group discussion and arrive at a solution:

- Fun, non-threatening but purposeful activities;
- Direct instruction presentations;
- Partner-work activities;
- Small-group discussions; and
- Role-play.

However, there are also disadvantages to workshops. As noted by Villegas-Reimers (2003), too large a number of participants may pose a problem in scheduling, securing a venue, conducting hands-on activities and paying attention to individuals. Participants may be exhausted from daily duties leaving their work at school unfinished. Intimidation may arise from those who participate actively participating and some teachers may fail to voice their opinions and so refrain from attending further.

#### (vi) **The use of Information Communication Technology (ICT)**

The use of ICT is vital in the context of the increasing demands being placed on education (Anderson, Courtney, Timms, & Buschkens, 2009). ICT is often associated with being a programme for providing knowledge and includes the ability to use computers and related technology efficiently. ICT consists of a range of skills from a basic level to programming and problem-solving. An initiative from the White Paper on e-Education (2004) necessitates the use of ICT to improve the quality of teaching and to provide personalised learning experience. ICT is taken as a threefold process that takes teachers through leaning *about*, *with* and *through* ICT. According to Loveless (2003), the use of ICT is personal and professional in a sense that teachers need to have confidence and competence when preparing, planning, managing and assessing learner participation and competence. Teachers have to explore the skills of using computers to integrate educational practices and supplement normal teaching processes and resources to support new ways of teaching.

ICT has promoted e-learning in many countries (Rodrigues, 2005), with the Internet providing intra-class communication channels and encouraging research by providing access to scarce information. The Internet has potential as a communication channel for teachers'

professional development while many programmes now include competency in ICT in completion professional development of programmes.

As opposed to the traditional way of training where teachers who underwent professional development courses that, including ICT, the participants only knew about the importance of technology and how a computer works. They might have performed a few tasks but were not shown the practical side of using the technology. Currently, some teachers have expanded their knowledge in the use of ICT, and know how to use this technology to support student learning and to assist them in lesson planning and teaching (Rodrigues, 2005).

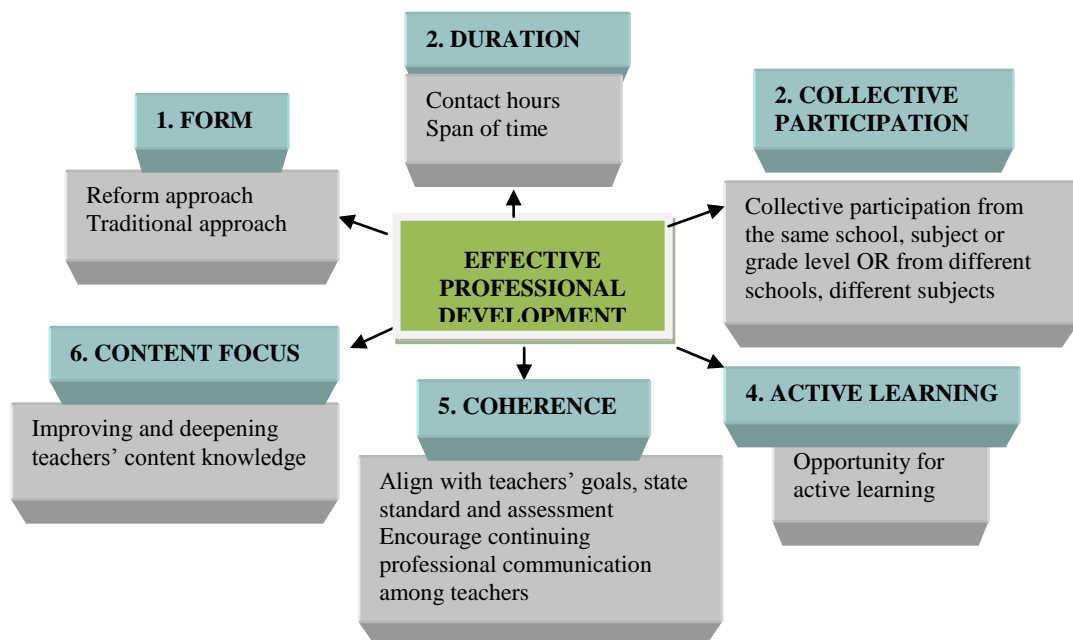
Different subjects derive different benefits from the use of ICT e-learning and e-teaching. For example, some sciences subjects can demonstrate the use of data loggers, simulation, models, and spread-sheets and programming in some cases. The majority of teachers who received professional training in ICT have appraised it as getting them started and building their confidence. However, improvement in the training is still needed in terms of life-long learning and increasing familiarity with a wider range of skills. Online support for teachers has grown. For example, national assessment exemplars, resource packs and even reports of previous studies are available online. Loveless (2003) further mentions that teachers who have undergone training in ICT training, understand the effective use of ICT to support teaching objectives, professional efficiency and development. For example, teachers understand effective teaching through exposure to lesson plans and new ideas on the Internet, while collaborative learning and online dialogue can support professional development too.

However, ICT not only minimises a teacher's work in lesson planning and presentations, it has also placed far more demands on teachers. According to Hooker (2008), teachers have to learn to handle computers in the classroom, compete with learners in accessing information through the Internet and most of all, know how to download and use software and hardware to enhance the teaching and learning process. Initially, the introduction of ICT was seen as a move to reduce monotony and to develop new skills. In terms of teacher professional development it was successful in this regard, as well as encouraging learning rather than only delivering a lesson, but also enhancing a teacher's pedagogical content knowledge. However, the challenges of a poor power infrastructure, lack of resources, and poor network coverage persist. Continual teacher attendance of workshops and seminars is one way of helping

teachers master their experiences of working with computers and encouraging them to increase their level of competency and proficiency.

## 2.5 FACILITATING EFFECTIVE PROFESSIONAL DEVELOPMENT

Drawing from the literature, there are concerns on what makes professional development most effective in helping teachers gain new knowledge and skills to improve their teaching practice. Initially, research found that effective professional development activities were characterised by effective facilitation, group dynamics and the adaptation of the activity to meet teachers’ needs. In reviewing the literature on the effectiveness of professional development, a range of scholars (Belzer, 2013; Haslam, 2008; Steiner, 2004; Birman, Desimone, Porter & Garet, 2000) collectively, evaluate professional development activities using the identified features for effective professional development suggested by Guskey, (2000): form, duration, collective participation, active learning, coherence and content focus. Haslam (2008) goes further and makes the distinction that the first three features are related to the nature of the activity and the latter three form part of the process of effective development (Figure 2.2). When guided by these key features, education programme developers can design meaningful activities for all teachers.



**Figure 2.2: Features for effective professional development**

Steyn (2005) also used these features in his study on invitational education. These features help establish effective activities and services as part of a professional development programme and Belzer (2013) and Guskey (2000) define them as follows:

- *Form* refers the distinction between the traditional (workshops, courses for credits) and the reformed (collaborative, networks) activities. The form of activities set the context of the other features of the activities. For example, the reform activities calls for sustained period of time, and activities are likely to offer teachers more and sufficient opportunity to be active participants in their own learning.
- *Duration* refers to both the total number of contact hours and the span of time over which the activities take place. Sessions for effective activities should be longer than an hour or two.
- *Collective participation* refers to the degree to which the activities emphasise the collective participation of groups of teachers from the same school, department or grade as opposed to individual participation. Activities should encourage teachers to participate as a collective and they are provided allow teachers to share material, assessment needs, common understanding of instructional methods, problems and solutions.
- *Content-focus* refers to the degree to which the activities emphasise the extent to which teachers' content knowledge is improved and deepened.
- *Coherence* refers to the degree to which the activities align with national/provincial/district policies. Activities should have an integrated, planned set of topics and skills based on a defined objective. Additionally, it is imperative to link professional development activities with the EDC vision and mission statement.
- *Active participation* refers to the extent to which the activities offer opportunities for active learning. The key element in active learning is the opportunity afforded to teachers to observe the facilitator and being observed in their classroom.

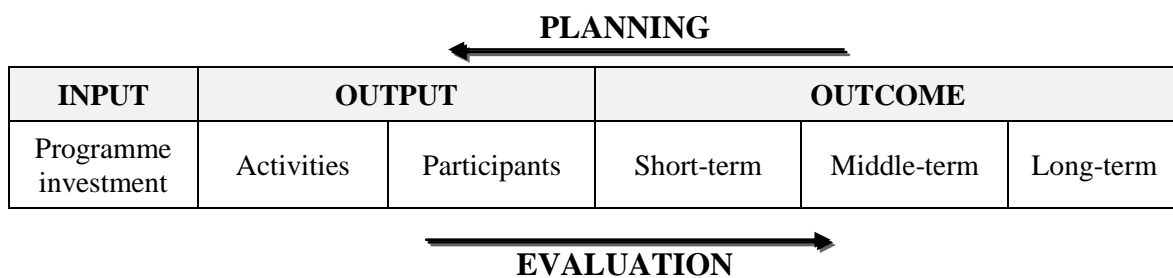
## 2.6 CONCEPTUAL FRAMEWORK GUIDING THE STUDY

Guskey (2000) and Patton (2008) perceive evaluation as a way to determine the value of an initiative in terms of delivering the intended and expected goal. A logic model was identified

in the literature review as an appropriate tool to guide the evaluation of the teacher centre activities and services. For example, Taylor-Powel, Jones and Henert (2008) use a logic model as an evaluation framework; Taylor-Powel and Renner (2003) regard a logic model as a tool for programme improvement; Russ-Eft and Preskill (2009) use a logic model to evaluate learning, performance and change efforts; and Gill (2010) uses a logic model as a performance management tool that provides a picture of the organisational goals. A logic model further indicates what needs to be assessed to adequately explore all aspects of teacher centres.

A basic logic model serve as a framework to direct and guide the evaluation of teacher centre activities and services, as a graphic representation of a logical relationship between the invested resources, the process of implementation and the changes that result from a sequence of events. Silverman, Mai, Boulet and O’Leary. (2009) assert that the structure of a logic model helps in refining a programme’s vision and mission by identifying components and procedures appropriate to achieving the desired outcome. The basic logic model (Figure 2.3) depicts the elements of evaluation within the input, output and outcome levels.

Though the development of the logic model for the purpose of evaluation is from left (the input side) to right (the outcomes side), it is reality developed from right to the left (Figure 2.3). This means that the evaluator begin by identifying the intended outcomes, work backwards, to build-on the activities and inputs. The reverse approach (from the left to the right) is developed using the ‘how’ question.

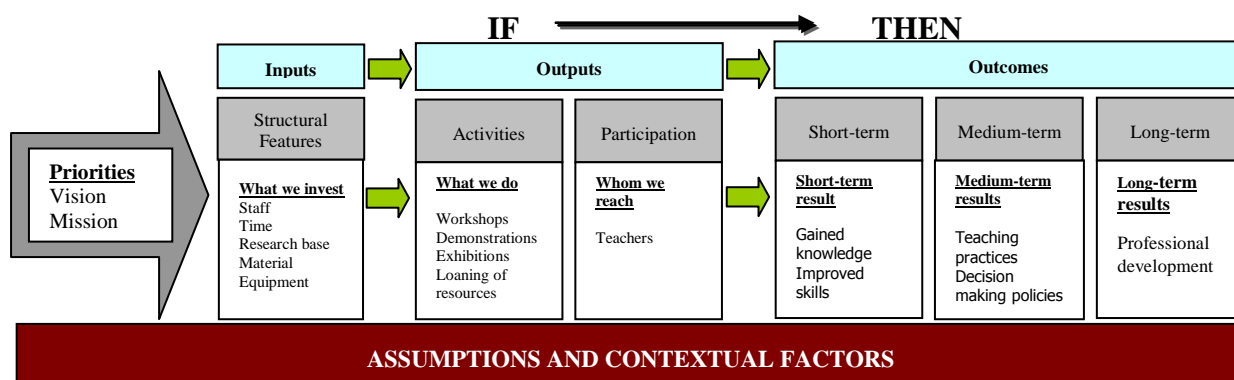


**Figure 2.3: The evaluation process**

The development of the logic model is guided by the “if-then” approach (Figure 2.4) of sequence which, according to Farrel (2009), specifies the relationship between the specific activities and the objectives. McCawley (1997) regards the “if-then” approach as a tool that demonstrates a chain of cause and effect relationships. From the “if-then” sequence,

conceptualising a few assumptions assist in maintaining focus and direction and help formulating questions about what is to be evaluated. This approach helps to visualise the relationship between the elements within the input, activities, output and outcomes components (Rowitz, 2012; Gill, 2010), which is a process that transforms inputs into outcomes.

For example, if need x (input), has been conducted, then y (output) will be effectively addressed.



**Figure 2.3: A basic logic model framework**

Since most teacher centres are not organisations for profit, the vision and mission are not aimed at achieving a financial benefit rather they serve as terms of reference for the basis of the centre activities and services.

As a system model, the logic model depicts the connection between the input, output and outcome. In addition, the assumptions and the contextual factors form part of the logic model since they influence the programme decision making. Contextual factors may include factors such as resources, programme implementation and staffing, participants and recipients while assumptions refer to the way we think the programme will work.

The components of evaluation in a logic model (Figure 2.4) are explained in depth in the table below.

**Table 2.3: Components of logic model**

Logic model Component	Operational definitions
Input	Resources, contributions that are needed to mount the programmes' activities. It is what the centre invests on and includes the personnel, finance and other resources.
Outputs	Direct changes that have occurred as a result the participants' engagement in the activities; they are the direct services and the product of the organisation's activities
Activities	Activities and events that occur as part of the programme – workshops, training, meetings; these help the organisation to accomplish its goal; examples of activities include: workshops, demonstrations, exhibitions and loaning of resources.
Outcome	The desired result of the programme divided into short, medium and long-term outcomes.
Short-term outcome	The immediate effects of the activities; they often focus on knowledge and attitude; examples, include increased knowledge and improvement in certain skills
Medium-term outcome	Behaviour and normative changes; for example, changes in behaviour or learning
Long-term	Refers to the desired result of the programme and it often takes a long time, ultimately leading to professional development
Assumptions	Beliefs about the programme that include the funding of the programme, the attendance of teachers and incorporate partnerships
Contextual factors	The environment in which the activities and services are provided and external factors that influence the provision of activities; often, there is no control over the contextual factors.

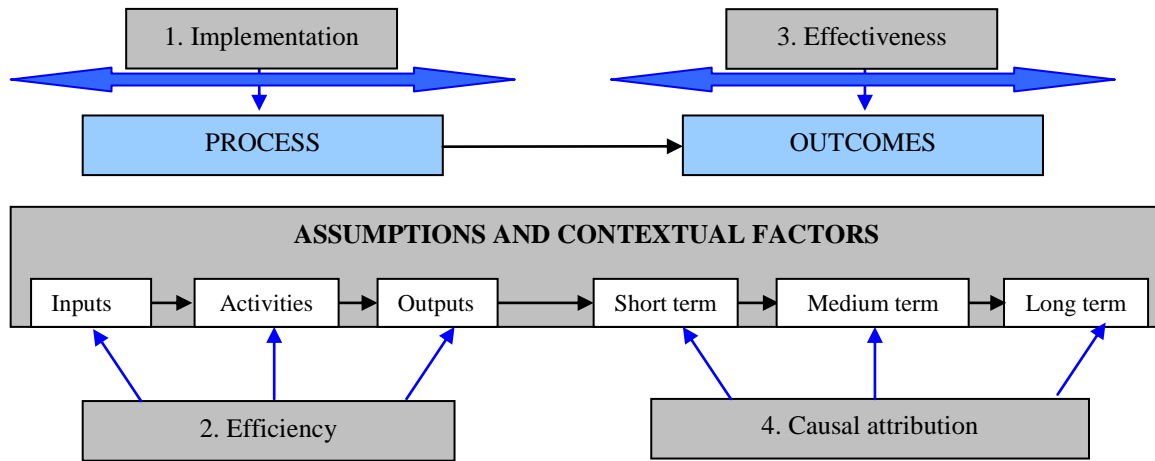
This study was conducted under the following assumptions:

- adequate material, equipment, facilities to ensure full participation;
- adequate staff to ensure full participation;
- adequate time to ensure full participation;
- adequate funds to ensure full participation; and
- quality activities and services to enhance professional development.

Making use of the logic model provides a framework for understanding the process in which activities and services are presented, identifying gaps that exist and determining what works. Figure 2.4 depicts two evaluation domains, as described by Silverman, et al. (2009): *process evaluation* assesses whether a programme has been implemented as planned and identifies the challenges and strategies associated with its implementation and *outcome evaluation*



determines the effectiveness in which the intended outcomes have been reached and whether the changes can be attributed to the activities. Both these evaluations are focuses on the objectives and assess progress towards achieving them.



**Figure 2.4: Evaluation domains in a logic model (American Heart Association, 2006)**

The relationship between the four components of the evaluation domains: the implementation, the efficiency, the effectiveness and the causal attribution, are defined as follows:

- The implementation component is characterised by the realisation of activities and services in terms of quality and quantity to achieve the set objectives. The vision and mission determine the activities and services of the teacher centre.
- The efficiency component necessitates the observation of the relevancy, usability of resources and sustainability, implications and opportunity costs. Knowing ‘what works’ helps re-align activities while knowing ‘what does not work’ allows the strengthening of implementation strategies. The evaluations also include the sufficiency or provision of resources to accommodate centre activities and services.
- The effectiveness component focuses on whether the EDC activities and services are achieving the intended goals.
- In the causal attribution component evaluation focuses on the organisational changes.

A detailed description of the assumptions and contextual factors are noted as contributory elements to the implementation and effectiveness of activities and services. The preliminary

account of the logic model assumes, but does not explain, how the output in the process domain results in the three levels of outcomes.

The logic model facilitated the mapping of questions, as shown in Table 2.4. These questions were distributed among the sampled participants during the interviews during which the discussion was guided by the questions listed in the interview schedules and the teachers' questionnaire while identifying contextual factors surrounding the implementations process of the activities and services in the study.

**Table 2.4: Examples of elements and evaluation questions in the logic model**

	INPUT	OUTPUT		OUTCOME
	Resources	Activities	Opportunities for learning	Short-term
Elements	<ul style="list-style-type: none"> <li>▪ Form of activity</li> <li>▪ Centre resources</li> <li>▪ Collective support</li> <li>▪ Contact hours</li> <li>▪ Vision and mission</li> <li>▪ Duration</li> </ul>	<ul style="list-style-type: none"> <li>▪ Workshops scheduled</li> <li>▪ Services rendered</li> <li>▪ Presentations and demonstrations</li> <li>▪ Coherence</li> </ul>	<ul style="list-style-type: none"> <li>▪ Content focus</li> <li>▪ Active participation</li> <li>▪ Feedback on practice</li> <li>▪ Collaborative learning</li> </ul>	<ul style="list-style-type: none"> <li>▪ Teacher perception</li> <li>▪ Knowledge and skills acquired</li> </ul>
Guiding questions	<ul style="list-style-type: none"> <li>▪ Is the vision and mission of the centre clear?</li> <li>▪ What resources are in place to support professional development?</li> </ul>	<ul style="list-style-type: none"> <li>▪ What activities and services are provided for professional development?</li> </ul>	<ul style="list-style-type: none"> <li>▪ What is the level of participation in the EDC activities and services?</li> </ul>	<ul style="list-style-type: none"> <li>▪ What skills and knowledge did teachers gain?</li> <li>▪ What benefits did the teacher gain?</li> <li>▪ What are the teacher perceptions towards the activities and services?</li> </ul>

	INPUT	OUTPUT		OUTCOME
	Resources	Activities	Opportunities for learning	Short-term
<b>Evaluation Questions</b>	<ul style="list-style-type: none"> <li>▪ Does the EDC have a computer centre/ laboratory?</li> <li>▪ At what time are activities conducted at the EDC?</li> <li>▪ How long do these activities last?</li> <li>▪ What form of support does the EDC receive?</li> <li>▪ Are the resources adequate for professional development programmes?</li> </ul>	<ul style="list-style-type: none"> <li>▪ What types of activities are provided at the EDC?</li> <li>▪ Are the activities in line with the EDC vision and mission?</li> <li>▪ Who are the main facilitators for the EDC activities?</li> </ul>	<ul style="list-style-type: none"> <li>▪ How would you rate teacher attendance and participation during the training?</li> <li>▪ Are teachers involved in the development of EDC activities?</li> <li>▪ Are EDC activities and services relevant to teacher professional development?</li> <li>▪ Are teachers afforded opportunities to engage with the EDC activities and services?</li> </ul>	<ul style="list-style-type: none"> <li>▪ How would you rate the knowledge and skills gained by teachers?</li> <li>▪ What are the teacher perceptions of EDC activities and services?</li> <li>▪ What activities and/or services would you like to see at the EDC?</li> <li>▪ How do teacher perceive EDC activities and services?</li> </ul>

## 2.7 CONCLUSION

This chapter provided an overview of the context in which professional development activities and services are conducted. The strengthening of teacher knowledge and skills has been the major objective of teacher centre programmes. Harwell (2003) relates to the fact that professional development needs a context that supports it and the content should increase a teacher's subject knowledge and sharpen instructional skills. The literature emphasise that the process of professional development should provide teachers with an opportunity to reflect on knowledge acquired and practise the skill attained.

In exploring the literature further, the role and functions of teacher centres were clarified. It was noted that quality activities and services depend on the organisational support of the centres and the appropriate selection of the activities. One of the biggest challenges still facing teacher centres is that some centres continue holding on to a traditional approach to activities: Centres become a storage house for equipment and resources, wait for teachers to use the venue for meetings or to borrow material. Nonetheless, with an intention to limit the obstacles for effective provision of quality activities and services, it became clear, from the literature reviewed that the conditions under which teachers learn have to be met. Different

types of reform activities were identified and key features to assess the effectiveness of the content were noted. The chapter concluded with a proposed description of the development of conceptual framework to evaluate the quality of the activities and services to enhance professional development.

The significance of this chapter is that it has shown that a field of knowledge relative to the topic of this study exists. The literature revealed the context in which effective professional development is provided, the content of quality activities and services and the teachers' learning strategies.

The next chapter discusses the study method and techniques employed for data gathering.

## CHAPTER 3

### RESEARCH DESIGN AND METHODOLOGY

#### 3.1 INTRODUCTION

The purpose of this chapter is to discuss the data-gathering process for this research. Its focal point included the research design, the sampling procedures used in the selection of centres and for the participants involved with the centre activities and services, as well as the construction and administration of the instruments used to collect data.

This study is an evaluation of how EDC activities and services influence change in employing quality activities and services to support teacher practices. This chapter is guided by a qualitative mode of inquiry as an attempt to elicit responses to the research question:

*How do EDC activities and services in Mpumalanga enhance teacher professional development?*

To obtain responses to the main research question, four sub-questions were formulated as follows:

1. *What professional development activities and services do EDCs provide?*

This sub-question identifies the activities and services provided by EDCs. Most questions are addressed in the semi-structured interview questions with the centre managers (Appendix D-1/II) and the facilitators (Appendix D-III/IV). These questions provide the elements for evaluation in the output component of the logic model and evaluation focused on the sufficiency and relevance of these activities and services in relation to professional development.

2. *What is the rationale behind the development of EDC activities and services?*

The vision, mission statement and the key performance indicators were the starting point in the design of questions. The field notes (Appendix F) and personal reflection were used to corroborate data from the centre managers and facilitators' responses. Additionally, the EDC

contextual factors were evaluated to explore the extent in which they support the effective implementation of the activities and services.

Evaluation elements are found within the input component of the logic model. Emphasis was placed on the alignment of activities and services to the EDC vision and mission, the efficiency and sufficiency of resources and equipment, the support system of the EDCs to provide quality activities and services to effect changes to the professional development of teachers and the implementation processes of the activities and services.

3. *What is the quality of EDC activities and services in relation to the professional development of teachers?*

Evaluation in this sub-question explored the content of EDC activities and services against the key features of effective professional development programme as identified by Haslam (2008) and Guskey (2000), namely: form, duration, active participation, coherence, content-based, collective participation and determined their quality and relevance to meet teacher practices.

The teacher questionnaire (Appendix E) was used to substantiate the information gathered through the interviews on whether the EDC activities and services were implemented in accordance with the teachers' developmental needs.

4. *What are the teachers' perception of EDC activities and services?*

This sub-question addressed teachers' experiences and reaction to the EDC activities and services. Data collected for this sub-question through teacher questionnaires included teacher engagement frequencies with EDC activities and services, the amount of knowledge acquired, skill mastered and their attitude to the EDC activities and services. Few questions were also asked in the interviews to corroborate the teachers' experiences.

The unfolding of this chapter starts with the presentation of the research design (Section 3.2) which describes the process of evaluation and its importance. Section 3.3 outlines the research approach detailing the qualitative research approach. The research procedure and strategies (Section 3.4) frame the study setting and link to the sampling procedures. Outlining the instrument development and data collection processes (Section 3.5) is followed by data analysis (Section 3.6) and the reporting methods (3.7). The chapter concludes by presenting

the elements of trustworthiness (Section 3.8) and the ethical considerations (Section 3.9) noted in the study. This chapter is summarised in Section 3.10.

## **3.2 RESEARCH DESIGN**

Research design is a strategy of inquiry that provides specific direction for procedures in a study (Denzin & Lincoln, 2011). Similarly, a research design could be seen as a detailed systematic plan of how the specific study is to be conducted. Research design is also seen as a guide that arranges the components involved in conducting the study to work harmoniously together to promote efficient and successful results (Maxwell (2013).

The research design for this study is presented in a form of programme evaluation that is also known as process evaluation. The reason behind this approach was to assess whether the programme was implemented according to the set vision (Rossi, et al. (2004) while determining the achievement of the intended outcome of the vision. This involves determining how well the activities are delivered and the extent in which they enhance teachers' knowledge and skills. Specifically, process evaluation provides data for programme improvement.

Evaluation as a field is used to measure the organisational performance that is grounded on the organisational processes and effectiveness (McDavid & Hawthorn, 2006). According to Rossi, et al. (2004), evaluation entails a systemic assessment of the effectiveness of a programme with the intent of improving it. This viewpoint is generally in agreement with the definition of evaluation that Scriven (2007) gives in which it is seen as a process of determining the merit of an activity. Of particular interest is the implication that evaluation provides meaningful feedback to create structured opportunities for professional development.

Process evaluation assesses the efficiency of the programme, which in the case of EDC activities and services, refers to the relevancy and the appropriateness of the programme and the adequacy of the resources and material. Efficiency is assessed to determine the extent to which teachers benefited from the activities and services. For logical facilitating the evaluation of EDC activities and services, the study followed the use of a basic logic model as recommended by McDavid and Hawthorn (2006).

The focus of the evaluation was on the assessment of the quality of EDC activities and services. Quality in the study means that activities and services must:

- Align the curriculum and developmental need.
- Support appropriate intervention.
- Positively influence teaching practices.
- Make key reform real and effective.
- Drive instructional improvement
- Improve shared knowledge and skills.
- Meet the teachers' classroom needs.
- Address the teachers' content subject to ensure consistency with the curriculum.
- Provide teachers with a chance to collaborate.
- Include opportunities for active learning of new skills and teaching strategies.

### **3.3 RESEARCH APPROACH**

The evaluation design is qualitative in nature with the aim to explore the EDC activities and services in their richness of context (Patton, 2008) and to understand the meaning teachers ascribe to these activities and services. This includes understanding the EDC context and the implementation of its activities and services from the viewpoint of the participants and through detailed descriptions of the EDC setting. Many problems central to the implementation of activities and services are deeply embedded in the context of social interaction (Ulin, Robinson & Tolley, 2005) and as such, a qualitative approach to conducting this research was deemed most appropriate. Even though a qualitative approach is often not regarded as systemic, it has proved to be the most reliable approach to providing in-depth information. The rationale behind the adoption of a qualitative approach was to be able to develop rapport with participants and for participants to give their opinions and describe their experiences, perceptions and interaction freely (Punch, 2005).

#### **3.3.1 Characteristics of the Qualitative Research Design of this Study**

Various research purposes for which qualitative studies are useful take into consideration:

- understanding the meaning that participants give to the events, situations and actions in which they are involved;



- understanding the particular context within which the participants act, and the influence this context has on their action;
- understanding the process through which the events and actions take place;
- collecting data from the participants ‘point of view’;
- selecting participants purposively who can contribute information-rich understanding of the phenomena (see Maxwell, 2005; Creswell, 2013).

Given these advantages of qualitative research approach, also other elements were critical during the course of data collection:

- ensuring that researcher bias does not prejudice the design of the study;
- acknowledging that participants may have been influenced previously about the desired result which would affect the outcome of the study;
- being in a position to handle or search for background information that is missing;
- acknowledging that a sample is not automatically representative of the larger population;
- recognising that short-term outcome of a particular element might not be a true reflection of the benefits or the intended goal, professional development.

The study was located within the interpretivist paradigm that can be linked to constructivism because of its emphasis on relying on the individual to construct meaning. The interpretations are also based on a particular context and time. According to Lincoln and Guba (1989), interpretivism is concerned with understanding the phenomena from the subjective experiences of individuals and it allows for greater focus on issues of influence and impact. This affirms the main tenet of interpretivism that research can never be objectively observed rather it is observed through individuals’ experiences. Knowledge claims and findings were gathered through the interviews with the participants.

In summary, this study conducted systemic data collection on the nature of the EDC activities and services. Similarly, in accord with the work of Stufflebeam & Shinkfield (2007), this study evaluated the data collected to determine whether resources were relevant and used efficiently; whether the service rendered was sufficient and appropriate; and whether the activities and services were implemented as planned.

### **3.4 RESEARCH PROCEDURES**

The study was prompted by interest in the various professional development programmes in Mpumalanga province. An extensive review of the literature on the various professional development programmes was conducted to access the related body of knowledge underpinning the study (Ridley, 2012).

After a thorough review of the literature, a proposal was drafted and submitted to the University Ethics Committee for approval. Once the proposal was approved, it was forwarded to the Mpumalanga Department of Education requesting that permission be granted to conduct a study in the province. The same letter of request was taken to the specific District Office where the study was to be conducted and further extended to the sampled EDC centre managers and teachers who were requested to participate in the research.

Consent letters (Appendix C) were forwarded to all participants during personal visit to the centres and schools. Attached to the consent letters was the letter detailing the nature of the study, ethical considerations as well as the risks it might hold for the participants. Terms and conditions for data collection were negotiated with all participants agreeing to the procedure to be followed. Only one participant did not agree to the interview being audiotaped.

The actual data collection period covered almost five consecutive months although the fourth and the fifth month was mainly for site observation and follow-up sessions to further clarify some of the interview questions. Data was collected during working hours and the availability of the centre managers and the facilitators guided the programme for data collection. On some occasions, the EDC administrators would assist with the site observations.

#### **3.4.1 Research Setting**

The research setting refers to the context in which the data is collected. Data in this study was collected in two EDCs in the Ehlanzeni District of Mpumalanga. Both centres are located in rural areas supporting poorly resourced schools. The reason behind the selection of these EDCs was to verify activities and services managed by the same District Office and having a common context. However, it should be expected that factors in each centre would differ. For the purpose of this study, the EDCs were referred to as 'Centre-A and Centre- B'.

For the study to take place in the participant's normal surroundings allowed a clearer picture of the setting (Lichtman, 2010; Rossi, Lipsey & Freeman, 2004) and ensured trustworthiness. According to Pitney and Parker (2009), natural settings remain the major characteristics of qualitative research ensuring a face-to-face interaction with the participants. This allows for identification of external factors and secures a holistic understanding of the human experience under investigation.

### **3.4.2 Participants**

According to Gerrich and Lacy (2010) and Patton (2002), purposive sampling justifies the inclusion of rich sources of data and participants are often sampled from a pre-specified group. Two EDC managers and two subject advisors, one for Computers Science and one for Physical Sciences were purposively sampled. It is believed that the valuable experience of the centre managers could richly benefit the study. For anonymity in the study centre managers were referred to as Centre manager-A for Centre-A and Centre manager-B for Centre-B. Subject advisors in this study will be referred to as facilitators and they are very significant in this study as agents of change.

With the advancing technology, computers are often used in the classroom for teaching and learning. Computer literacy is therefore indispensable to improving teacher practices. They not only assist teachers in curriculum delivery, but they also enable teachers to effectively keep records and access curriculum information. The rationale behind the choice of the two facilitators as participants was based on evaluating the extent to which the teachers had been exposed in computer skills and through the use a computer developing teaching subject content knowledge. De Vries, et al. (2011) assert that science is often taught in a traditional and formal way that can create a negative attitude to the subject if taught in this way. This study therefore explores the use of computers in teaching and understanding the content subject.

The study further sampled sixteen teachers involved in teaching either one or both subjects chosen for this research. Woods (2006) notes that representative sampling cannot be achieved in qualitative research due to (i) the nature of the research, (ii) the weight of work in data gathering and processing, and (iii) the problems of negotiating access, especially to teachers. The option to sample a limited number of teachers was further informed by Singleton and

Straits' (1999) recommendation that observing all cases may lead to a less accurate description of the phenomenon than would a carefully selected and smaller sample.

Twenty (20) participants were sampled for the study from two different EDCs, as shown in the table below.

**Table 3.1: Composition of study participants**

Centres	Centre manager	Facilitators	Teachers	Total no. of participants
2	2	2	16	20

### 3.5 INSTRUMENT DEVELOPMENT

The strength of using a qualitative approach in this study is in the use of a multiple data sources, including interviews, questionnaires and field notes. Owing to its qualitative nature, interviews were used as the primary data collection instrument. However, to gather the richness and more insightful information on the phenomena, field notes were taken during the interviews and responses to questionnaires were used to find out more about perceptions. The inclusion of open-ended question provided teachers an opportunity to express themselves more openly and encouraged authentic responses while providing in depth information. In addition, a personal journal was kept in which all the visits were documented.

#### 3.5.1 Interview Schedule

The study used in-depth, semi-structured interview techniques to allow for individual opinions (Woods 2006, Lichtman 2010) and flexibility (Patton, 1990) in order to capture the reality of the nature of activities and services. Semi-structured interviews are very helpful in guiding the interviews while obtaining a reliable and comparable qualitative data. The inclusion of open-ended questions provided the opportunity to obtain additional information and enabled the researcher to do follow-up interviews to establish clarity on uncertainties regarding questions and answers.

The interviews with the centre managers focused on the background of the centre, management styles and development of programmes and activities, activities and services

offered, challenges facing the day-to-day running of the centre and their opinions on an ideal productive centre. The centre manager is responsible for the smooth running of all the centre activities hence he was requested to provide a detailed description of the centre procedures. A follow-up on the interviews was conducted with the centre managers concurrently with the site inspection.

Interviews with the facilitators focused on the facilitators' experience in the subject, trainings offered, challenges encountered and opinions on improving the centre's activities and services. The facilitators were also encouraged to provide any input that they felt might help to sustain the centre's activities; views on innovative activities to enhance professional development of teachers and how regular monitoring could be implemented.

Face-to-face interviews were conducted with all participants who allowed rapport to develop during the interviews. Notes were also taken during the interviews to record verbal and non-verbal cues, a strategy used by Klenke (2008) to capture views and perceptions of participants. All interviews but one was audiotaped with the permission of the participants following a suggestion by King and Horrock (2010) to confirm the value of keeping a full record of each interview. The recorded information was transcribed and resulted in text that was analysed for further interpretation.

### **3.5.2 Open-ended and Close-ended Questionnaire**

Although questionnaires are not commonly used in qualitative studies, because they do not allow participants to respond to a stimulus, it was used as a secondary data source to the qualitative information collected as suggested by Woods (2006). The strength of using open-ended questionnaires is that most participants are comfortable and confident in responding to questionnaires in the absence of the researcher (O'Hara, Carter, Dewis, Kay & Wainwright, 2011).

The administration of the questionnaires involved delivering them to schools personally, irrespective of several drawbacks that doing this entailed. These included that it was time consuming, costly, faltering of answers to responses often due to the effect of the researcher's presence. Regardless of these drawbacks, face-to-face delivery motivated teachers to participate in the study. During the completion of the questionnaire, teachers asked for

clarification in ambiguous questions and the researcher probed further and asked for clarity in the case of vague responses. The strength of delivering the questionnaires by hand in this study is that the response rate was precise.

Both open-ended and closed-ended questions were included in the questionnaire to discover underlying meanings and patterns in relation to professional development, particularly the latter. Open-ended questions permitted participants to put down detailed views and suggestions while short and focused questions were to reduce bias. In sum, both open- and closed-ended questions complemented each other and ensured quantifiable and in-depth data (See table below).

**Table 3.2: Comparison between open-ended and closed-ended questions**

Open-ended questions	Closed-ended question
<ul style="list-style-type: none"> <li>• Include freedom and spontaneity of answers</li> <li>▪ Allows time and space for free form of responses which invite participants to share their understanding, experience and reaction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Easy to administer</li> <li>▪ Easy to code and analyse</li> <li>▪ Allow comparisons and quantification</li> <li>▪ Complete questionnaires developed while avoiding irrelevant responses</li> </ul>

The questionnaire consisted of the following three sections

- Section A** Classification: to gather background information
- Section B** Behaviour/Perception: to understand EDC engagement
- Section C** Knowledge: to ascertain quality of Professional Development activities and services

A variety of closed-ended questions provided multiple answers to choose from and this made responding easier and quicker. Below, is an example of an odd-question format, which accommodates participants that do not have a precise answer and avoid guessing.

For example,

Please indicate the extent in which you disagree or agree with each of the following EDC activities and services statements. (Please mark one choice in each row.)		Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1	I gained a lot from the EDC activities and services	1	2	3	4	5
2	The facilitators know their subject content	1	2	3	4	5

Maxwell (2010) revealed the argument that the absence of quantitative methods and numerical data in qualitative evaluation lacks evidence-based and prevent the study to be a “scientific inquiry” in that it contained no statistics and its conclusions were not credible. He further argued that numbers make claims more precise than terms used such as *many*, *often* *sometimes*. Emanating from this argument, the study therefore, focused on exploring contextual knowledge of EDCs and quantifying variables to show patterns.

According to Maxwell (2010), incorporating numbers in the study helps in providing the number of instances of a particular type of activity or services rendered, quantifying the occurrences to validate the conclusion, providing systematic evidence for diversity and identify patterns that are not apparent from the unquantified qualitative data. In addition, assessing the amount of evidence in the data presents a particular conclusion.

It should be noted that while questionnaires are not among the prominent methods within a qualitative paradigm they do have their uses. In this research, the use of questionnaires enabled the researcher to collect information from a wider sample than could be reached by interviews (Woods, 2006). Furthermore, Creswell (2013) contends that gathering both quantitative and qualitative data does not constitute a mixed methods design, as this does not speak to the integration of the data.

### **3.5.3 Field notes**

Mulhall (2002) defines field notes as messy, loose text written during unstructured observations. This definition aligns with Bazeley’s (2013) view that different forms of notes should be taken while in the field. In addition, that field work was to be conducted in a natural way as unobtrusively and judgement-free as was possible (Bogdan & Biklen, 2003). Since the interpretive paradigm depends on the observed data collected and meaning made by the researcher, good descriptive analytic notes of the setting can be taken during the interview process and during the site visits.

Thick descriptive notes depicted the events and setting in as much detail as possible. Although notes were initially written in researcher-created codes with unconnected sentences,

they were later refined. The notes included; a detailed description of the location of the centre with a description of the physical setting, on gaining entry to the settings, noting the staff characteristics, their welcoming (emotions), actions, dress and interaction recording everyday events and activities on visits to the centre, documenting the researchers' time of arrival and departure and activities while there. Notes on the participants' involvement in the activities and their actions were taken.

Reflections and ideas for further analysis, as described in Section 3.8.4 were written concurrently with the field notes (see Appendix F).

### **3.5.4 Personal Journal**

A personal journal that contains reflective notes explores the researcher's feelings, thoughts, experiences and emotions were kept during the research (Bogdan & Biklen, 2003). Radnor (2002) asserts that reflexivity which is "a process of self-evaluation primarily informed by the thoughts and actions of the researcher" (Lichtman (2010, p.206) is associated with subjectivity; thus the researcher needs to reflect in order to develop an objective stance towards the research. This is further expounded by Creswell (2013) to keep a reflective frame of reference as some interpretation is shaped by the researcher's own experience and background. Seeing the possibility of quality approach not being objective and judgement-free, Lee, Liebenau and DeGross (1997) suggest that observational data and feelings be recorded in the personal journal.

The journal included reflections on methodological challenges during data collection, speculated themes and ideas that emerged while collecting data, and ethical issues concerning reactions to participants and ethical conditions (Bogdan and Biklen (2003). The observations recorded emanates from how the researcher relate to the setting and the events (Yin, 2011 and Cassell & Symon, 2005). Moreover, the journal was kept to complement the data during the interviews by capturing extensive notes on non-verbal gestures. Much of what was written in the journal provided back-up information during the analysis phase of dealing with the data in adding the deeper description of the setting.



## 3.6 DATA ANALYSIS

According to Creswell (1994), Hatch (2002), Bogdan and Biklen (2003), analysis is a way of making sense of the qualitative data collected, organising it, breaking it into manageable units, and searching for patterns and what is to be learned from them. Contrary to a quantitative study, data analysis was done simultaneously with data collection activities (Woods, 2006; Creswell, 1994). Continuous data analysis led to new avenues of inquiry and allowed the researcher to go back and refine questions and come up with new themes and patterns. The study produced a large amount of textual data in the form of transcripts from interviews, coded questionnaires and observation field notes.

Drawing from the qualitative approach, textual data were explored inductively using qualitative content analysis (QCA) to classify the information into categories and draw conclusions by identifying themes (Hsieh & Shannon, 2005). In this study, content analysis is defined as strategy for the subjective interpretation of the content of text data through the system classification process of coding and identifying themes. Inductive analysis allowed the research to proceed from the raw data to developing general themes (Lichtman, 2010; Patton, 1990).

### 3.6.1 Managing and Preparing the Data for Analysis

Qualitative research data consisted of transcribed recordings of interviews, detailed field notes of observational research and personal reflective notes made during the research. Coded data from the questionnaires were also set aside for analysis. Data was analysed using a coding system.

The data went through a number of analysis stages that included familiarisations, identifying of codes, developing categories and finding pattern and relationships. Developing **familiarisation** of the data means that the transcripts and filed notes were read repeatedly to achieve immersion and get a sense of the whole from the raw data.

**Identifying codes** began with ‘open-coding’, which means categorising data in search of pattern, themes and meaning that emerges. Codes enabled the researcher to reduce data into smaller groupings or paragraphs so that the data became manageable. Pictures taken during

site observation were placed under the relevant themes. Both inductive codes and priori codes were used. The priori codes included the key features for effective professional programme: coherence, collective participation, duration, active participation and content-based. Families of inductive codes were followed to group the data as described by Bogdan and Biklen (2003):

- *Situation codes* in which the description of the EDCs, the setting for the workstation and for the interviews.
- *Process codes* covered the changes noted over events and over time. Similarly, the output noted as a result of the input implemented.
- *Event codes* included specific activities and services that occurred during the programme evaluation, irrespective of the frequency with which they occurred.
- *Strategy codes* referred to methods or techniques used to accomplish a set activity. EDCs use, for example, workshops or demonstrations to execute developmental activities to teachers.
- *Key features for evaluating codes (priori codes)* which included the features for professional development, that is: duration, coherence, active participation, collaboration and content-based activities.

**Developing categories** was done by grouping codes into meaningful clusters. Categories were further divided into sub-categories. Research questions assisted in generating some categories.

**Finding theme patterns and relationships** was done by comparing and combining disconnected categories, searching for similarities and differences to identify patterns; and summarising them as themes. These themes were later used in the compilation of the findings for the study. Creswell (2013) asserts that codes are very useful in designing detailed descriptions for a specific study.

In the analysis of questionnaires, open-ended questions were coded much the same as the interview transcripts and some interesting responses were quoted verbatim in the final report. Since answers in a closed-ended question are specific, each response was given a number during the development of the questions that represent the value for further interpretation and analysis. For example:

1.	How often do you attend EDC activities?	Always <sup>1</sup>	More often <sup>2</sup>	Sometimes <sup>3</sup>	Never <sup>4</sup>
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Responses for closed questions were entered into Microsoft Office excel spreadsheet by organising them in tables sorted in questions, following this example below:

### Example for coding closed questions

Student questionnaire				Codes <ul style="list-style-type: none"> <li>• Always = 1</li> <li>• More often = 2</li> <li>• Sometimes = 3</li> <li>• Never = 4</li> </ul>
	Q1	Q2	Q3	
Teacher A	1	2	4	
Teacher B	3	3	5	
Teacher C	1	2	3	
Teacher D	1	3	4	

Although it is sometimes confusing to use the questionnaires in a qualitative research study, the responses from the questionnaires were used as categorical data in the analysis not merely counting the frequencies of categories but searching for the empirical diversity in the data even if the data was expressed in numbers (Brittain, 2002). The quantifiable data provided a reliable qualitative database as it provided the numerical distribution of the characteristics of teachers in the sample while open-ended questions allowed for the detailed description of the teachers' perceptions.

A descriptive analysis technique was used to provide a summary of the study using a combination of tabulated description and graphical description and discussions of the results. Much as in the analysis of interview transcripts and field notes, data review in the open-ended questions was done by identifying themes, patterns and relationships.

### 3.7 TRUSTWORTHINESS

The study included the descriptive validity of the situation and the interpretative validity of the participants' experiences (Miles & Hurbeman, 1994). Qualitative research consists of five methods to establish trustworthiness, namely, credibility, transferability, dependability, confirmability and reflexivity.

*Credibility* seeks to establish truth in the researcher's findings (Ulin, Robinson & Tolley, According to Patton (1990), it does not depend on the sample size but on the richness of information gathered and on the analytic abilities of the researcher. To enhance credibility, a number of aspects were considered.

Triangulation of data was ensured using different methods and the use of a wide range of data sources. Secondly, findings were referred back to participants as the means of members checking (Lincoln & Guba, 1989) to ensure credibility and authenticity of the findings. Findings were reiterated at the end of each interview session to allow the participants to critically analyse, comment and affirm the accuracy of the interpretation of data. Finally, field notes necessitated persistent observation and record keeping ensuring understanding of the true perspective of the environment in an unobtrusive manner (Section 3.5.3). This included the centre features, the participants' behaviour and actions. This was then complemented by the personal or reflective diary.

*Transferability* is concerned with the extent to which the findings of a particular study could be applied to other situations. Since this is a qualitative study conducted in two EDCs and data collected from a small sample, it is impossible to demonstrate that the findings and conclusions could be applicable to other EDCs with different contexts. However, thick description of the EDCs, sampled number of participants involved, data collection methods employed and activities and services assessed enable the reader to compare instances and events with those in their environments. This information is provided for consideration before any attempts are made for transference.

*Confirmability* refers to the degree to which the researcher demonstrates neutrality of the research interpretations (Lincoln & Guba, 1989). Ensuring real objectivity requires the researcher to be neutral in the interpretation of the data. Data from different sources was kept to enhance confirmability. In addition, triangulation techniques used could be useful tools. Keeping raw data such as field notes for another researcher to verify the data when presented with the same data insured use of an audit trail.

*Dependability* relies on describing in detail the methods of data collection, analysis and interpretation to facilitate auditability. Overlapping techniques were used in the study to secure reliability, which ensured that if the work were repeated, in the same context with the

same methods and the same participants, similar results would be obtained. However, the aim is to be able to replicate the findings (Ulin, et al. 2005)

Lichtman (2010) argues that the issue of *reflexivity* is not only a ‘recognition of the self, but also recognition of the other’. During data collection, the researcher remained attentive to sensitive sites and embarrassing or humiliating situations to maintain trust with the participants. The researcher questioned practices from which the participants felt obliged to respond to, thus member checking was essential. Descriptive data was reported as objectively as possible.

### **3.8 ETHICAL ISSUES**

Woods (2006), Bogdan and Biklen (2003) assert that the main ethical debate in qualitative research revolves around the participants’ right to privacy. The following ethical practices were employed to protect the participants’ rights as suggested by King and Horrocks (2010).

Research objectives were articulated verbally and in writing so that they were clearly understood. Prior to the data collection, research procedures were discussed with all participants and consent forms signed as a gesture to give consent to participate in the research. All participants were reminded that participation was voluntary and that they were free to withdraw from participation in the study at any time while the study was in progress. To respect the participants’ anonymity and exposing the centres, pseudonyms were used, for example Centre-manager-A.

Participants were treated with respect (Creswell, 2003) and their responses treated with sensitivity throughout the data collection process. Permission was requested to take pictures around the EDCs.

### **3.9 CONCLUSION**

This chapter discussed the instruments used in gathering the research data for this study. The questionnaire, semi-structured interviews and the literature assisted in gaining insight into the quality of the activities and services provided at the EDCs. Again, the multi-method approach used ensured rich information to understand teachers’ perceptions and reactions to determine

the nature of the activities and services. The inductive analysis of the qualitative data best suited the purpose of this study which could have been lost if a quantitative approach had been used.

The next chapter discusses the treatment of the collected data, its analysis and interpretation. The findings will attempt to cover key issues that could lead to the improvement of EDCs' activities and services. When considering the findings, while responding to the key insights, they remain subjective. These findings do not intend to elicit the best and the worst activities and services in the province to enhance professional development of teachers.

## CHAPTER 4

### PRESENTATION OF RESEARCH FINDINGS

#### 4.1 INTRODUCTION

This chapter provides detailed analysis of the provision of quality activities and services with the purpose of highlighting how these activities and services enhance teacher professional development. The process of analysis, as Boeije (2010) puts it, includes working on the data to make sense of it in the light of the research questions that guided the study. The findings emerging from the data were obtained from semi-structured interviews (Section 3.5.1) and the self-administered teacher questionnaires (Section 3.5.2). The field notes (Section 3.5.3) and reflections from a personal journal (Section 3.5.4) were used to triangulate and substantiate the credibility of the data. The qualitative data was transcribed then analytically coded to create categories according to the aspects of professional development.

This chapter starts by presenting the demographic data of the participants (Section 4.2). The presentation of the findings according to the themes that emerged followed; the organisational support (Section 4.3.1), the content of the activities (Section 4.3.2), the prevalence of quality activities and services (Section 4.3.3), teacher reaction (Section 4.3.4), outcomes of professional development activities (Section 4.3.5). The chapter was summarised in section 4.4.

#### 4.2 DEMOGRAPHIC INFORMATION OF PARTICIPANTS

Both centre managers had about five years of experience as centre managers and one of them had accumulated managerial experience as a deputy principal. One of the centre managers assisted with giving information about the plans for the future regarding the EDCs as a provincial official had referred the researcher. While the centre managers are responsible for the activities in their own respective EDCs, they still collaborated in certain programmes, for example, programmes from the district or head office.

Interestingly, both subject advisors sampled for the study had facilitated activities through the EDCs for a substantial period almost twice the years of the centre managers. Their experience

revealed that the working conditions at EDCs are not improving. Both facilitators have been exposed to the Japanese way of working with EDCs and were already in the system when the Japan International Cooperation Agency (JICA) donated basic equipment for the EDCs.

A sample of sixteen teachers from primary and secondary schools, involved in Natural Science or Physical Sciences and/or Computers Science, completed the questionnaire. There were no challenges in accessing the schools since the researcher was previously their subject advisor. However, as the study was mainly on assessing the presence of quality EDC activities and services, teachers responded honestly and with anticipation that the results would enhance their professional development. The informal discussions with this group revealed that only one teacher was the head of school, two were head of departments in their fields and some taught other subjects and had additional duties in the schools such as the coordination of examination processes and extra-mural activities.

A remarkable majority of teachers (12 in total) were males but this can be explained by representing the fact that teaching the science subjects tends to be a male-dominated field, which is an interesting phenomenon in our education system but calls for female recruitment to balance the gender gap and bring in different competences of skills, knowledge and attitudes.

Almost all teachers were permanently employed (Table 4.1) with an exception of one teacher who was temporary employed and one teacher employed by the School Governing Body (SGB). Development of teachers is, without any doubt, the responsibility of the Department of Education. The two teachers who were not employed by the Department portray an indication that there was a need for teachers in the system. Most of the teachers in the sample (7 in total) had between six and ten years teaching experience and more than half (9 in total) were in the 30-39 years of age group (Table 4.1 and 4.2). Only two teachers in the sample are at an average of 40 – 49 years of age.

**Table 4.1: Teachers' ages and conditions of employment**

No. of Teachers	Age	No. of Teachers	Condition of Employment
4	25-29	14	Permanently employed
9	30-39	1	Employed in a temporary capacity by the Department
3	40-49	1	Employed by School Governing Body (SGB)



Data was collected from qualified teachers with seven of them holding honours degree and three teachers with a junior degree (Table 4.2). It is encouraging to note that teachers have upgraded their qualifications from a certificate and two-year diploma to three-year diploma and above. Probably, the majority of these studies were done through self-initiative distance learning.

**Table 4.2: Teachers' experience and academic qualifications**

No. of Teachers	Teaching Experience	No. of Teachers	Academic Qualification
2	1-2 years	3	Junior degree
5	3-5years	7	Honours' degree
7	6-10 years	4	Master's degree
1	11-15 years	2	Doctoral degree
1	16-20 years		

These findings reflect that professional development does not depend on a teacher's age, years of experience, state of employment or qualification. Continuous professional development is significant in the teaching profession.

### 4.3 EMERGING THEMES

This section will first present the background of the EDC context, after which the interview and the questionnaire responses will be dealt with concurrently. Owing to the nature of the study in analysing the teacher questionnaire, numbers were used to provide a simple and precise picture of the responses and in line with prescriptions for reporting corresponding to qualitative research. The field notes and the notes from the personal journal were only used to supplement this data. This section documents the different ways in which EDC activities and services effect changes to teacher professional development under the following themes: organisational support, the nature of EDC activities and services, prevalence of quality activities and services, teachers' perception and the outcomes of professional development activities and services. It is worth mentioning that, although the study focuses on two EDCs only, the reporting on the teacher perceptions was not assigned to a specific EDC.

### **4.3.1 Organisational Support**

This section addresses how the EDC sought to make changes with regard to bringing in quality activities and services that would enhance professional development. These activities and services are analysed to verify whether they support the vision and mission of the centre by reflecting on the key performance indicators. Structural features for effective development are used to evaluate the activities and services in terms of the form, and the level of participation

#### **4.3.1.1 Background information of the EDCs**

Data from the field notes revealed that both sampled EDCs were located in semi-rural areas providing services to under-resourced schools within at a radius of almost 100 kilometres. The EDCs are alongside the main road that makes access easier for teachers. As it will be revealed later, the distance did not have a major effect on accessing the EDC. The Department of Education ensured adequate security at the entry gates to ensure safety of equipment, especially, computers and other electronic material. It would appear from the reflective notes that the security guards were trained, as they would not let any car pass at the gate without first inspecting the car. However, the difference in the infrastructure between the two EDCs was noted: EDC-A is a one multi-building centre while EDC-B has a new structure consisting of a computer and laboratory centre; library and kitchen; administration and conference room. The staff composition for EDCs consist of centre manager, an administrator and two general workers, one for the garden and one for cleaning the centres. However, during data collection, EDC-B had only one general worker for the garden. The administrator had to ensure that the centre is clean while waiting for a general worker to be deployed at the centre.

#### **4.3.1.2 Addressing the key performance indicators**

In exploring the basis on which EDCs determined the activities and services to support professional development for teachers, an assessment of the key performance indicators was conducted against the EDC vision and mission (EDC Document 1). Since key performance indicators serve as quantifiable measures to assess the extent to which the EDC activities and

services support the centre's vision, it is measured in terms of the level in which the activities and services effect changes in supporting professional development of teachers.

It emerged from the interviews that centre managers did not receive any induction on their appointment as managers. Centre Manager-B explained that he was only given the EDC vision and mission statement (Table 4.3) that encapsulates what the EDC stands for and what it desires to accomplish, in order to align his activities. The availability of this document remains the most useful source of information about the purpose of the EDC that is available to any person taking the position of managing the centre.

**Table 4.3: Vision and mission of EDC and key performance indicators (KPIs)**

<b>Vision</b>	A centre for organising, providing and co-ordinating access to ongoing support, in-service training and professional development for educators
<b>Mission</b>	<ul style="list-style-type: none"> <li>▪ Working in partnership with all stakeholders to organise, co-ordinate and support ongoing In-service training</li> <li>▪ Creating an atmosphere conducive to assist teachers in their ongoing professional development</li> <li>▪ Effective utilisation of all resources</li> <li>▪ Assisting teachers in developing teaching and learning material</li> <li>▪ Having available a range of up to date resources and reference material</li> <li>▪ Providing a high quality service to all schools and teachers.</li> </ul>
<b>Key Performance Indicators</b>	<ul style="list-style-type: none"> <li>▪ Organise, provide and co-ordinate access to ongoing support, in-service training and professional development for teachers</li> <li>▪ Network information across the education community served by the EDC</li> <li>▪ Encourage teachers to play an active role in education development</li> <li>▪ Develop and distribute the EDC Programme to school and register teachers for training sessions</li> <li>▪ Render advisory services for educators.</li> <li>▪ Acquire relevant curriculum and teaching resources.</li> <li>▪ Manage EDC staff and resources</li> <li>▪ Promote access to and use of resources</li> </ul>

These key performance indicators were taken from the expectations on advertised posts for EDC managers.

- **Organise, provide and co-ordinate access to on-going support, in-service training and professional development for teachers**

The primary role of the centre managers to organise, provide and co-ordinate access to on-going support, to offer in-service training and professional development for teachers is directly aligned to the EDC vision. Organising entails a systemic arrangement of a series of activities and services, ensuring support for its implementation. With limited resources, centre managers used alternative strategies to provide in-service training to teachers. While Centre manager-B invited schools in smaller numbers for basic computer training assisted by the administrator, Centre manager-A made arrangements with nearby schools which had computer laboratories, for the training of basic computer skills. A series of other activities and school support visits were reported as administered by the centre managers. When asked to mention the support system the centre managers provide to schools, Centre manager-B said:

*“I have supplied schools with magazines which I personally bought from my own pocket at the supermarket; I buy those magazines and make copies of the educational clips then supply to schools. I have presented the usefulness of the lesson study to the principals and the circuit managers.”* (Centre manager-B, June 2012)

The interview responses revealed that pursuing this performance indicator was hindered by the lack of EDC funds. Without a budget allocated for the programmes, it was impossible to design any form of support let alone purchase material or equipment for teaching and learning. The centre managers mentioned that the budget was specifically allocated only for the day-to-day running of the EDCs, for example, the photocopier papers and office stationery. Centre manager-A clarified the use of the budget and said:

*“The budget is mainly for administrative issues like, ink, printer, toilet paper – the Department services the printers. We are not crafting or drawing the budget ourselves, it is decided from the head office and it covers mainly the administrative work and the salaries, subsidised car.”* (Centre manager-A, June 2012)

The facilitators confirmed their frustration with facilitating a practical subject without appropriate and adequate resources. They further explained that this challenge was reported to the relevant officials in the Education Department, in response they were told of the Department cost curtailment measures. Ultimately, it would seem that most of the in-service

training conducted at the EDCs was not organised by the centre managers but was independently organised by either the facilitators or the clusters<sup>4</sup>. In this instance, the EDC's responsibility was to provide access to a favourable venue conducive to learning the use of equipment and making the resources required available.

- **Network information across the education community served by the EDC**

From the literature, Harwell (2003) regard teacher networking as powerful synergy to bring about effective professional development. Educational networking can help teachers to access learning resources and people with information. The physical positioning of the EDC permits the centre to be a powerful channel through which information is provided across through the education community within their reach. Technological tools such as Internet services, have made networking viable for teachers, yet little could be extracted from the interviews to show that the EDCs were capable of co-ordinating teacher networking in this manner.

The EDCs lost popularity when Internet services could not be activated. Centre manager-B indicated that teachers used to visit the centre for accessing educational information. Not having computers to download programmes using the Internet was a major drawback for the cluster. With the growing developments in technology, the wish for the centre manager and the Science facilitator to see at least a SMART board for interacting collaborative learning in the centre where many schools could be reached through one lesson controlled at the centre was slowly diminishing. When the Physical Science facilitator was asked about what improvement he would like to see in the EDC, he said:

*“. . . smart board, white board, presentation gadgets, and science books in the library, top of the range laboratory, laboratory assistance and continuous educator development programmes by the EDC.”* (Physical Science facilitator, July 2012)

Drawing from the definition of teacher networking as small ensembles of teachers doing the same subject or grade (Villegas-Reimers, 2003), this study has picked up teacher networking in the form of cluster collaborations. The centre managers supported the cluster collaboration and he elaborated on how the clusters were functioning.

*“they (teachers) have their own meetings without the subject advisor, though the subject advisor would be aware of their programme.”* (Centre Manager-A, June 2012).

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<sup>4</sup> Group of teachers in the same area with common teaching interests/subject meeting voluntarily.

The teachers in the sample confirmed that networking worked well through the cluster system. EDC activities and services are best presented in groups, as teachers can be encouraged to share experiences.

- **Encourage teachers to play an active role in education development**

The involvement of teachers in the development of an EDC programme has a positive effect when addressing teachers' needs (Rodrigues (2005)). As seen from this study, decision makers do not invite inputs from teachers, which led to a sense of lack of ownership. This practice is often called the top-down decision making (Rodrigues, 2005). A question was formulated in the questionnaire to verify the extent to which teachers were involved in the development of EDC activities. Ten of the sixteen teachers indicated that they had never participated in the development of activities and five teachers who said that they might have been, were referring to the development of cluster programmes and partly to their involvement in the Science Fun activities that were held annually.

Centre manager-A affirmed that teachers are not involved in the development of EDC programmes, however, assisted by the subject advisors their cluster meetings consisted of a variety of educational activities including lesson presentations and content enrichment. The Physical Science facilitator further explained how teachers are engaged in the education development:

*“Clusters normally draw a programme for topics that are challenging and discuss them. They also do lesson studies which is a programme initiated by the Japanese.”*

(Physical Science facilitator, July 2012)

- **Develop and distribute the EDC Programme to schools and register teachers for training sessions**

English and Wilson (2004) stressed that EDC should serve as a central place where teachers can collaborate and share experiences. According to the centre managers, it is not possible for the EDCs to develop their own programmes due to the absence of centre-based facilitators, a limited budget allocation and needing to promote impromptu projects from the Head Office. Attempts were made in the EDCs to distribute newsletters but this could not be sustained because of financial constraints. Centre manager-A was asked to explain more fully why the newsletter was discontinued and he said:

*“We had many problems with that, first we must have the photographer and all the material to capture the centre activities, the main challenge we had was not having the colour printer. Each time we had to produce a newsletter we had to liaise with communication section at the head office for printing it was taxing.”* (Centre manager-A, June 2012)

The newsletter could, however, have assisted teachers not only in the distribution of the EDC programme but also in bringing awareness of EDC activities and services to the community at large.

As indirectly highlighted earlier on, both centre managers expressed their dissatisfaction of not having centre-based facilitators as a contributing factor to not developing EDC annual programmes. Centre manager-B explained this further and stated that, as a manager, his role was to ensure smooth running of all centre activities or programmes and manage the staff and resources. However, due to the absence of facilitators, they had to conduct the activities themselves. Further clarity on the issue of having facilitators in the EDCs comes from this statement:

*“Activities are either conducted by the district subject advisors, by Head Office using contracted organisations, by teachers themselves and other activities that I initiated or mandated by the Head Office to conduct.”* (Centre manager-B, June 2012)

A question was asked to Centre manager-A as to whether they were able to arrange their own programmes and he said:

*“No, the budget would not allow us. Activities are from the head office and hence they are financed there.”* (Centre manager-A, June 2012)

Apart from the impromptu projects conducted by the EDCs, there are activities, which are conducted by the clusters and the subject advisors. These activities, together with instructions from the Head Office, are viewed in this study as the EDC activities, given the explanation by Centre manager-A. However, in his response the Physical Science facilitator stated that Science activities are his own initiative. He said:

*“but then these activities are mine, the EDC only offered a venue.”* (Physical Science facilitator, July 2012)

Under these circumstances, it is not easy to develop and distribute an annual programme from these EDC activities as they occur irregularly.

- **Render advisory services for educators.**

An EDC is a crucial facility for serving people involved in education about their professional development as it can contribute to any initiative that strives to improve the level of teaching and learning. For this reason, there is a great need for advisory services to come from the EDCs that are led by the policies of the country's education system. However, from this investigation there is little evidence that centre managers have visited the schools in their official capacity. Teachers did report that they received advice from centre managers and some of the activities conducted to assist schools were: adopting a learner programme, responding to the National Teacher Award Programme and the Code of Professional Ethics<sup>5</sup> Programme.

However, the Physical Science facilitator was confused about the fact that centre managers visited schools, being under the impression that they were supposed to be coordinating activities and services at the centre rather than visiting schools. In his response to improving the EDC programme, he further said:

*“But to me the job description of the centre manager is really not clear to me. They are always in schools like circuit managers, monitoring I don't know what. I believe they should focus on the EDCs not what they are doing.”* (Physical Science facilitator, July 2012)

The facilitator also suggested providing a special course for centre managers, an idea that Centre manager-A confirmed it was already in motion. A follow-up response to the issue of centre managers visiting schools was that they were not infringing on the domain of the curriculum per se but were rather trying to identify challenges facing teachers and suggest possible intervention strategies. In his response Centre manager-B said:

*“I have conducted the action research in my own adopted schools. I am using a designed tool to collect school needs on curriculum management and come up with intervention strategies.”* (Centre manager-B, June 2012)

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<sup>5</sup> Guideline for professional and personal conduct for SACE members; which embodies the values of respect, care integrity and trust.



For precise roles to be executed, Centre manager-A mentioned that all centre managers have been enrolled with the High Institution for Action Research course prescribed by the Department of Basic Education in which they will offer strategies to identify teacher needs and intervention strategies to use. Currently, the EDCs do not serve as full advisory centres as per the official definition, but fulfil the role of a developmental centre.

- **Acquire relevant curriculum and teaching resources**

The outcry about lack of resources from different sources, suggests that this deficiency is a major hindrance for the overall provision of quality activities and services. Since the material to kick-start the EDCs operation was supplied, little or nothing more has been delivered to support professional development activities and services. The centre managers have a concern with the Department placing constant restrictions on expenditure leading to the EDCs having to operate on a paper budget. When explaining how the EDC budget works, Centre manager-A said:

*“we do not have a budget where we can stock chemicals according to the needs of the schools. We do not have a lee-way to replace equipment that is short because we are not allocated a budget for that.”*

*“. . . we are not crafting or drawing the budget ourselves, it is decided from the head office and it covers mainly the administrative work and the salaries, and subsidised car.”* (Centre manager-A, June 2012)

The field notes described the computer centre and the new library in EDC-B as only having cubicles and keeping old textbooks aimed at the old curriculum. However, the centre manager indicated that he collects educational clips and supplies schools and extra copies are placed at the library for further reference. However, Siddiqui (2008) has suggested that EDCs should subscribe to educational journals or magazines and have updated material delivered to the EDC.

- **Manage EDC staff and resources**

Normally one would expect the EDC to have its own facilitators for a specific function. However, EDCs in this study have only an administrator and two general workers. The absence of centre-based facilitators, therefore, contributes to lessening the quality of activities and services, particularly in the storage system and identification processes for lending

schools. The current facilitators indicated that they cannot run programmes at the EDC and again do school visit. When asked on how to manage the EDC resources, he said:

*“a lab assistant should be stationed at the EDC to design and run continuous professional development programmes for teachers, unlike now we are busy I can’t be focusing on school while running the centre.”* (Physical Science facilitator, July 2012)

Although centre managers are employed to co-ordinate activities, they end up facilitating EDC activities and are assisted by the administrators. The centre managers reported that they trained teachers on the use of the Modlin Question Bank programme to develop items, Code of Professional Ethics to improve on their professional behaviour, and the basic computer literacy. Most of these trainings were conducted to the underperforming schools that achieved less than the provincial benchmarking criterion of a 50% pass rate in Grade 12, and to the Circuit Management Teams (CMT), consisting of circuit managers and school principals. However, re-training was done in schools where they discovered that the training has not been cascaded from management to teachers.

Although Centre manager-B reported to have drafted a letter requesting a career guidance centre from a private sector, the facilitators do not see this effort as befitting. The facilitators’ concern is based on the inadequacy of resources and equipment and hence questions the job description of the centre managers as the Physical Science facilitator aptly put it: *“if schools are able to secure computers and resources from private companies, what stops the centre managers to negotiate such deals.”* This could be a reasonable concern which, when seriously considered, could alleviate the resource challenges at the EDCs.

- **Promote access to and use of resources**

According to Hoppers (1998) and Siddiqui (2008), EDCs are supposed to have a range of equipment for loan and facilities to enable teachers to develop own teaching and learning material. However, this study revealed limited access to resources channelled by the resources at the centre. Teachers have shown a need for a centre to provide resources, given that their schools are poorly resourced. One teacher commented on an open-ended question that they most often do not get what they need at the EDCs, and further suggested that EDCs should live according to its prescribed expectations. The question needed teachers to elaborate on the services they receive at the EDC and a response was:

*“When you visit the EDC they would show you boxes only to find expired or empty bottles.”* (Teacher-G, August 2012)

The inadequacy of the resources hindered the development of quality EDCs activities and services to enhance professional development of teachers. In summary, there is little possibility that the EDCs’ input could yield the desired output given the limited responsiveness and support of the key performance indicators of the centres’ vision and mission.

#### **4.3.1.3 Resources and equipment to maximise change effort**

The literature revealed that the name change of Mpumalanga EDC resulted after a reflection that development best suits the function of the centre than a resource centre. Siddique (2008) argued that EDCs do not necessarily need to be fully resourced to start functioning, but the minimum equipment and resources can keep the centre functioning while adding resources periodically. This was the case with the sampled EDCs, where, according to the responses from the centre managers, resources and equipment were provided by the JICA on the inception of the EDCs. The aim was to kick-start the operation of EDCs while identifying resources that best suited teachers’ needs. Since then, little has been supplied to the EDCs through the initiatives of the Science facilitator. The supply of equipment was diverted to the Dinaledi schools<sup>6</sup> that tended to host professional development activities.

Participants were asked to explain how they felt with the issue of resources. The responses gave an indication that the situation was untenable. Centre managers were limited by the budget, as it did not allow for the purchase of resources. Furthermore, even their requisition could not be attended to for several years due to curtailing expenditure. The need for resources was felt when computers could not be serviced resulting in the discontinuation of Internet services. During the site inspection, the researcher noticed a number of outdated computers at the EDCs that, according to the centre managers, could no longer be serviced. During the period of data collection, EDC-B had only eight computers in the old computer centre, which teachers had to share during training while EDC-A reported to have twelve functional computers kept in the storeroom for safety from burglary. Although EDC-B had a

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<sup>6</sup> identified schools for the programme to improve performance and increase participation in Mathematics, Life Science and Physical Sciences

new building, there were no resources in the computer centre only empty cubicles. Centre manager-A indicated that a nearby school assists in terms of offering their computer centre for training. The same trend of using schools was adopted in EDC-B, leaving the EDCs available for meetings and other workshops.

It is worth mentioning that the quality of EDC activities and services relies on the availability of resources and services. If the EDCs' services, like the Internet are not reactivated and resources not sustained, the quality of EDC activities and services is likely to be compromised. Centre manager-B confirmed the teachers' claims that they are no longer motivated to visit the centre because of the limited resources, yet they were supposed to be the centre of development. Internet services play a critical role in advancing the technological era. However, as indicated by Centre manager-A, they await for the national promise that all EDCs would be provided with computers and Internet services, however, this assurance does not have a time frame. Centre manager-A was positive that EDCs would be in a position to be furnished with computers to support schools, in his explanation he said:

*“The National office is negotiating partnering with private sectors to be assisting EDCs with material, especially the computers and Internet connectivity,”* (Centre manager-A, June 2012)

During the period of data collection, Centre manager-B had to lend schools his personal laptop since the Modlin Question Bank program was installed on it. He explained how teachers worked through the Modlin Question Bank program and said:

*“a problem is that the centre does not have Internet connection and the program could not be loaded on the computers. There are 10 CDs for grade 12 and a few for the grade 9 learners. Presently, schools borrow my laptop to go through the program and this is only helping few schools.”* (Centre manager-B, June 2012)

This raises concerns that the Department of Education could purchase the program that needs a computer and access to the Internet but fail to realise that the programme is doomed to fail without the appropriate tools.

Facilitators too are highly challenged by the EDC setting. However, according to the Computer Science facilitator, they would wish for a fully equipped computer centre, there would still be a need for an Internet service to facilitate the downloading of programmes. He

further indicated that he downloads programs for teachers using his own resources. In his explanation, he said:

*“I have downloaded the software for maths and Science experiments and made CDs for all teachers to attend the weekend.”* (Computer Science facilitator, July 2012)

The same challenges have been reported for the Science subject. During the site inspection, outdated chemicals were seen lying all over the new science laboratory (Picture 4.1) in EDC-B. On enquiring about the reasons for the poor storage, the administrator explained that these were chemicals moved from the old laboratory to the new science laboratory and seemingly, there was no one to organise their storage since there was no centre-based facilitator or laboratory assistance.



**Picture 4.1: Physical Science laboratory in EDC-A (2012)**

The pictures above taken from the journal, depict the placement of resources in the laboratory. The researcher also noted resources and science equipment placed all over the floor in the two storerooms that were supposed to have shelves. The storage posed a serious hazard to the centre. Although the new science laboratory included all features needed in the laboratory, it still did not have furniture and running water, which is vital for conducting practical work. The Physical Science facilitator indicated that the centre prefers demonstrations since there is no water to wash the equipment after a practical work conducted by a cluster.

A worse situation prevails in EDC-A where chemicals were placed on the table in an office, exposed to the sun and some still in boxes (Picture 4.2). It seems as if the centre management does not take the necessary safety precautions with chemicals as some chemicals can easily burst into flames when exposed to the sun. Though some chemicals in the bottles were still sealed, some had already expired and were no longer in a good state to produce good results.

The existing storage system needs serious attention whereby some outdated chemicals should be disposed-off and others be kept in an appropriate place.



**Picture 4.2: Storage system in EDC-B**

Equipment in EDC-B was kept in steel lockers in the same office with some trays half-filled and some had never been opened. The existing storage system makes retrieval very hard. This is due not only to the unlabelled boxes but also to the EDCs not having an inventory book or register to keep track of the available stock. Teacher-D commented that they were no longer getting the services they need at the EDCs, and he said:

*“Every time when I need chemicals at the EDCs I do not get them, it is better if the EDCs could just close down,”* (Teacher-D, August 2012)

One potential facility the EDCs could offer teachers is a place for meetings. Though EDC-A have one multi-purpose room, it is so spacious that teachers commented that it was the best meeting place for the clusters. Teacher-C said:

*“The EDC provides us with a best place for our cluster meetings.”* (Teacher-C, August 2012)

Apart from the cluster workshops, the EDCs offer a range of activities, for example, exhibitions, Science week Fun activities and skill development training. On the day of data collection, the multi-purpose room in EDC-A was used by senior management to assess performance measures for principals in the circuit (Picture 4.3).

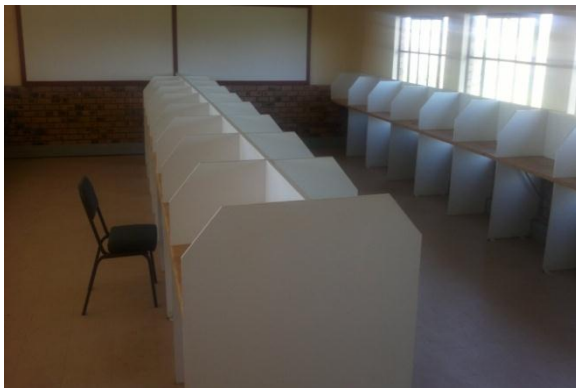


**Picture 4.3: Multipurpose room in EDC-A (2012)**

In contrast, although EDC-B has a new structure, the old structure is still used with almost five classrooms and the old computer centre as an addition to the new structure (Paragraph 4.3.1.1). However, some centres are under-utilised since they do not have appropriate furniture and equipment.

The computer centre in EDC-B (Picture 4.4) has only shelves with no chairs, computers and electric cables. The centre manager had no idea when the centre would ever have computers, let alone the Internet connection, which used to attract teachers. He explained the situation and said:

*“the ideas behind the establishment is good but then these are now just show rooms we do not know when we will get full service.”* (Centre manager-B, June 2012)



**Picture 4.4: Computer centre in EDC-B (2012)**

Similarly, the library is also furnished with shelves with no material or books (Picture 4.5). The centre has no librarian and the room is always locked. When the researcher inspected the

room, there were textbooks for the old syllabus on the shelves.



**Picture 4.5: Library in EDC-B**

Although the study revealed that a number of contextual factors limited the prevalence of quality activities and services, a lack of organisational support was evident. In essence, organisational features shape the quality of the activities and the services. Therefore, the identification of the organisational support system and factors that shape the quality of activities and services is critical (Mooney & Mausbach, 2008).

To improve the quality of EDC activities and services, Guskey (2000) introduces the evaluation of the teachers' learning and teachers' reaction. The teachers' learning (Section 4.3.2) included understanding teachers' needs in terms of skills and knowledge acquisition and identification of what activities and services are needed to enhance teacher professional development in the light of this study. The content of the EDC activities and services was discussed to provide a different dimension and explanation of the existence of the EDCs, while describing teachers' reaction (Section 4.3.3) referred to the teachers' perceptions of the professional development activities.

#### **4.3.2 Addressing the content of the EDC activities and services**

This section is central to the purpose of this study, for without an evaluation of the content of the activities and services on which to base a deeper understanding there is no basis for enhancing professional development. The quality of the professional development activities was assessed according to Haslam's (2008) analysis of the characteristics that focuses on the structural features and the core features of professional development experiences.



#### **4.3.2.1 The Structural Features of Professional Development Activities**

The structural features of the professional development activities refers to the design of the activities which includes (a) the form of the activities, (b) the duration of the activities, and (c) the degree to which the activities emphasises collective participation of a group of teachers.

##### **Forms of activities and services**

This study focused on professional development activities that directly enhance teacher practices and commitment in areas that need enhancement. Undoubtedly, the literature has identified the workshop as the most common approach to professional development. It generally involves a facilitator and participants who attend sessions at specified scheduled times. however, recent literature (Guskey, 2000; Haslam, 2008) criticise the use of traditional approaches, like conferences to support professional development as they neither allow for an opportunity for the participating teachers to reflect on what they are learning nor to deliberate on challenging issues including workshops which was regarded as the best method in the introduction of professional development cycle.

The form of an activity serves as a basis for the other features of effective professional development. For example, reform activity such as lesson presentation often takes place during a regular school day and allows for collective planning and follow-up presentations that forces collective participation and longer duration for reflections. Some activities, like the workshop, can possess characteristics of both traditional and reform type. The group discussions during the workshops change the traditional form of one-way demonstration activity to a reform type.

This study revealed different forms of activities that are responsive to what teachers need and which have a direct influence on changing teaching practices. A majority of teachers indicated to be actively involved in the workshops arranged at the EDCs that the facilitators and the centre managers described as hands-on activities, discussions, mentoring, presentations and demonstrations. The Physical Science facilitator described his activities as follows:

*“we normally conduct content-based workshops, especially experiments because it is where most teachers have a problem, focus in their training is classroom-based.”*  
(Physical Science facilitator, July 2012)

### **Duration of activities**

Duration includes the number of contact hours and the span of time over which the activity takes place. Although EDC are open for eight hours a day from Monday to Friday, the workshops still take place after school hours lasting for two hours only which is almost contrary to what Guskey (2000), Haslam (2008) and Zepeda’s (1999) regard effective professional development activity to be. Together with Steyn (2005) and Belzer, (2013) they assert that activities should not be once-off but a series of activities that will be provided over a longer periods. Furthermore, teachers need ample time for optimal learning and effective development to take place (Steyn, 2005).

As cited by both teachers and facilitators workshop sessions lasted for almost two hours and although they feel that the duration was not sufficient for the content, they had no control over the schedule of time, as it was mandatory from the Department of Education that teachers should not leave the schools before 13:00. The Physical Science facilitator commented on the time and said:

*“Teachers need more than two hours. Plus there is the issue of being tired and hungry.”* (Physical Science facilitator, July 2012)

Table 4.4 further indicated that the majority of teachers (10 in a sample of 16) attend the afternoon sessions that lasts for two hours. Given the new Curriculum Assessment Policy Statement (CAPS) training that took almost seven hours for four days, the total number of hours does not indicate sufficient time for teachers to reflect on all the activities for the year. However, the Physical Science facilitator added that continuous school visits and planned content workshops were conducted as a reflection to the activities on the CAPS training.

*“Even so, I do make follow-up schools support and teachers discuss content further in their cluster meetings.”* (Physical Science facilitator, July 2012)

Teachers were asked if they had challenges in attending training and reasons were listed as: transport not readily available, the centre not easily accessible, and most teachers by that time are tired. Yet despite these obstacles, the need for knowledge pushed some teachers to attend these activities. Table 4.4 presents the following information: three teachers attended

activities during the weekend and holidays respectively. The five hours and more of training duration could be linked to the holiday CAPS training and exhibitions; while the 3-4 hours could be the conferences that are held once or twice in a year.

**Table 4.4: EDC training times and duration of activities**

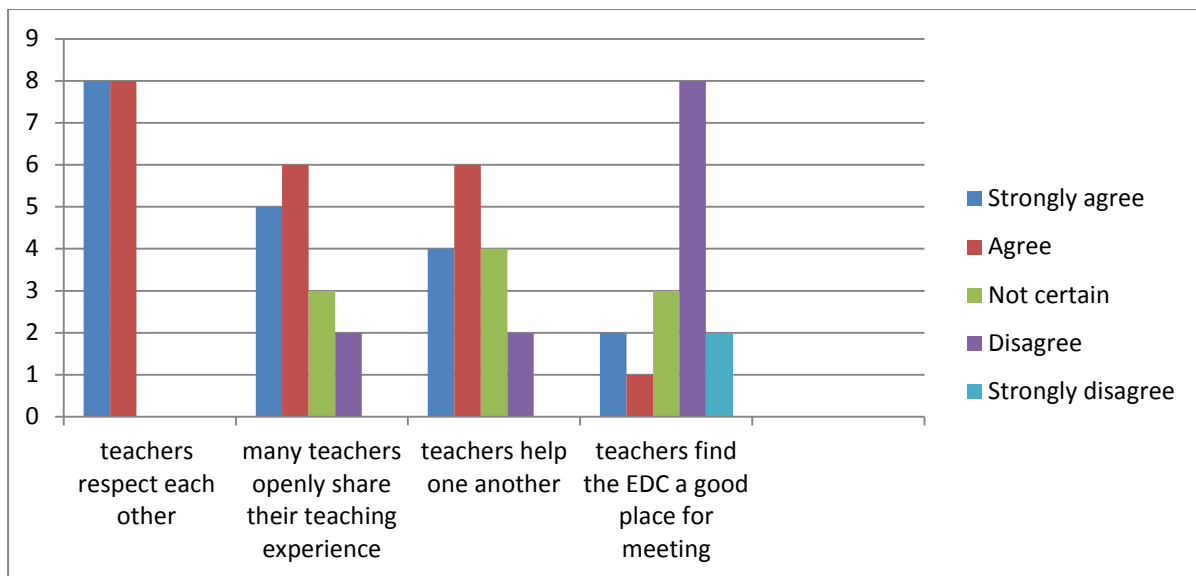
No. of teachers	Times of training	No. of teachers	Duration of training
10	After school hours	11	1 -2 hours
3	Weekends	2	3-4 hours
3	Holidays	3	5 hours and more

Although teachers could aspire to not having their holidays disturbed by the training, this does not happen as they held in the holiday so as not to clash with the Departmental guidelines that insist that learners should not be left unattended. According to the responses from the facilitators, there was an instance where the training attendance was not satisfactory as teachers felt that they needed their holidays.

### **Collective participation**

This study revealed that activities organised around collaborative participation attract benefits for teacher learning (Whalan, 2012). Most teachers participated in cluster meetings sharing collective responsibility for the benefit of individual professional development. Unlike individual learning, collective learning maintains network facilities and intensifies learning (Gaible & Burns, 2005) and opens up avenues for teachers to learn from each other and get deeper understanding of concepts.

Nevertheless, although teachers generally welcomed the opportunity to share ideas related to their work, respect and acknowledging each other's input differs tremendously (Figure 4.1). Teacher interaction contributes to the success of professional development with an underlying assumption that collaborative efforts are powerful and could increase an individual's sense of satisfaction and motivation. Teachers were asked to indicate the extent to which they agreed with the statements regarding their interaction.



**Figure 4.1: Teachers' interaction**

All teachers in the sample agreed that they respect each other. This is a positive attitude that benefits individual teachers and could be attributed to the fact that teachers are coming from different schools with each teacher having their own competencies. A high number of 11 teachers agree that they openly share teaching experiences with only two teachers indicating a negative response. This response corresponds to the ten teachers who agree that teachers help one another.

However, almost two thirds of teachers (10 out of 16) did not find the EDC good for a meeting place in contrast to three teachers remaining positive that EDC is a good place for a meeting. However, the negative response could be attributed to the inadequacy of resources.

Although some individuals are not free to participate in a cluster, the Physical Science facilitator indicated that cluster programmes are drawn up by the teachers themselves, selecting topics that are challenging for the majority, for sharing information and to determine appropriate action regarding the different dimension of teaching practices. As valued by Rhoton, Bowers & Shane (2001), teachers often find themselves working in isolation and thus cluster formation assists teachers to draw on experiences and knowledge from each other in a variety of settings, including lesson studies, practical activities and team planning. The Science facilitator explained how lesson studies were unfolding since it was introduced by the Japan Overseas Cooperation Volunteers (JOCV), he said:

*“everyone is involved in the planning, and they choose one teacher to present while the others critique the lesson.”* (Physical Science facilitator, July 2012)

The centre managers confirmed to have presented this type of an activity to the Senior Management Teams (SMTs) and CMTs. The centre managers indicated that the strength of this exercise is that teachers' lesson presentation and their deeper understanding of concepts are enhanced through the collaborative planning, analysis and reviewing of the presentation. Centre manager-A defined the purpose of lesson studies as follows:

*“the Lesson study we are running with CI, seeks to improve lesson presentation, in Maths and Science in Intermediate the exit points grade 6.”* (Centre manager-A, June 2012)

Collective participation enables teachers to discuss problems that arise during their development meetings or workshops. In addition, teacher collaboration helps teachers integrate what they have learnt with other aspects of their instructional content, as they are likely to share common material and assessment requirements when they are from the same grade or class. This activity is more likely to afford teachers an opportunity for active learning, although monitoring its implementation seems to be a challenge.

One drawback of lesson studies, as reported by the teachers and the Physical Science facilitator is that the exercise takes a long time and often delays them in their teaching processes especially when it comes to the presentation in a real classroom situation. They added that they often lack the ability to examine the lesson critically through a researcher's lens. Teachers-F explained his experience as follows:

*“Lesson studies take a lot of our teaching time – often we concentrate in the development and presentation of one concept for a long time and teachers tend to criticise others than the presentation”* (Teacher-F, August 2012).

In response to the challenges that might hinder the lesson study activity, the facilitators should assist teachers in proper planning and having a suitable selection of topics for the lesson study.

Positive teamwork was reported between the Physical Science and Computer Science facilitators in the simulation of Science projects as voiced by the Science facilitators:

*“the computer facilitator assists in bringing software and explains how it works.”*  
(Physical Science facilitator, July 2012)

While the Computer Science facilitator trained teachers on the skill of downloading programs onto their computers, and how to teach through them, the Physical Science facilitator focused on the content knowledge in the program. Synergy between the two facilitators was beneficial for the teachers and increased the number of teacher participation in the simulation workshop.

#### **4.3.2.2 Core features of Quality Professional Development Activities**

This section presents the extent to which the EDC activities and services afford teachers an opportunity to acquire knowledge and skills as an outcome result in relation to teachers' expectations. The evidence of whether knowledge and skills were acquired relied on the participants' opinions. The analysis determined the prevalence of quality professional development activities and services in relation to Guskey's (2000) identified core features for effective professional development that includes: (a) opportunities for active learning, (b) content based of the activities and (c) promotion of coherence in teacher professional development.

##### **Active learning**

Professional development activities that include opportunities for active participation have been reported to have increased teacher knowledge and skills. Activities that were noted that accommodate active learning involves planning, opportunities to observe teaching and learning, development of item bank questions and skills development in science experiments and computer training. Both Physical Science and Computer Science facilitators reported to have encouraged active participation during their workshop presentations. The Computer Science facilitator described how he manages his classroom activities and he said:

*“Together we work with the simulations activities. Those without laptops they have to share with friends. They get the program with a USB from their colleagues.”*

(Computer Science facilitator, July 2012)

Besides planning in the lesson study, teachers are afforded an opportunity to observe teaching and learning. While one teacher gets the opportunity to present the lesson, others observe the unfolding of the lesson and get an opportunity to comment on the presentation. Though, this may take time as noted earlier on, teachers are exposed to observe some mistakes and good

practices during the presentations. Teachers engage in working through the presentations improving steps they felt were not well presented. Some presentation may involve practical work either simulations or hands-on activities. This reinforces teachers' teaching practical skills.

During the development of item bank questions, teachers are exposed to the opportunity of developing their own assessments. The Modlin Question Bank programme helps teachers to have an idea of how the content is assessed and provides teachers with a wide range of questions. More importantly, teachers get the opportunity to handle a computer and reflect on their computer skills. Practical activities have enhanced not only teachers' understanding of science concepts and content knowledge but also assisted in developing teachers' PCK.

A further question was asked whether teachers agreed that skills development and learning takes place participating in EDC activities (Table 4.5). As many as nine teachers felt that they are not given an opportunity to develop skills whereas according to six teachers, the activities allowed them to develop skills. Teachers who are in the position to be actively involved are those that have personal laptops or can access computers at schools. However, if teachers were not proficient in computer use they would not be able to assess the activities knowledgeably.

### **Content-based**

This section assesses the degree to which the EDC activities and services deepens teachers' content knowledge specifically in Science. The relevance of EDC activities and services is assessed in relation to the teachers' expectations or needs. The Science facilitator was asked if apart from the CAPS activities, there were any other content-based activities to which he replied:

*“we normally conduct content-based workshops, especially experiments because it is where most teachers have a problem, focus in their training is classroom-based.”*

(Science facilitator, July 2012)

According to the facilitators, the EDC activities and services are very well supported, which shows that the content-based activities motivate teachers to continue attending to professional activities especially with the curriculum changing from outcome-based to having a content emphasis.

However, there are generic activities too, especially those facilitated by the centre managers, which do not seem to be directly in line with the curriculum such as the Code of Professional Ethics. Centre managers reported that although this programme has been diverted to the SMT portfolio there is filtering down to the teachers. This was revealed when Centre manager-B explained his findings when monitoring activities in schools. He said:

*“When we visit schools we find that some schools have not yet trained their staff. Thus we need to assist schools in training their teachers.”* (Centre manager-B, June 2012)

## **Coherence**

Coherence improves classroom practice as it indicates the extent to which professional development activities are integrated in a teacher learning programme and are consistent with the prescribed educational policies and goals. This study reported on activities like the Modlin Question Bank software program that has been approved by the Department of Basic Education on the basis that items are designed according to the DBE curriculum document and they support national and district standard on assessment ([www.modlin.org](http://www.modlin.org)). The quality of these assessment items is likely to enhance teacher professional knowledge and improve assessment competency. It is again, unfortunate that the compact disks or the program only have reached a limited number of teachers and schools. It would appear that, there is however, a great need for teachers to know the difference between assessment of learning and assessment for learning to align their teaching practices to assessment. Professional development is more effective when the activities are assessment-centred. A response from one of the teachers indicated cohesion in the item development activity and the classroom practice, which says:

*“The item development enables me to design a standardised test and learner performance is improving in the external papers.”* (Teacher-J, August 2012)

The Science facilitator confirmed that activities for CAPS training were extracted from the CAPS document that is in line with the national policy (DBE, 2011). Further evidence of coherence is seen in the project exhibition in which learners are motivated to adhere to the scientific guidelines of project presentations outlined in the curriculum document. Science projects afford both teachers and learners a significant opportunity to pursue their natural curiosity by placing emphasis on the development of science and technology. The Physical



Science facilitator explained that through the process of adjudication, teachers are exposed to various scientific and technological themes and they get an opportunity to listen and interact with eminent young scientists to gain the skill of being able to critique and evaluate projects.

### **4.3.3 Teachers' reaction towards the EDC activities and services**

Teacher reaction provides an important window through which the activities and services conducted at the EDC can be evaluated to foster meaningful restructuring of EDC activities and services. This study therefore compares the extent of teacher satisfaction and identifies which unsatisfied developmental needs have to be addressed. Teacher reaction reveals their perception and this was sought in accessing data on their participation rate, attendance, interest, frequency in engagement and the areas of developmental need as related to EDC activities and services.

#### **4.3.3.1 Participation rate**

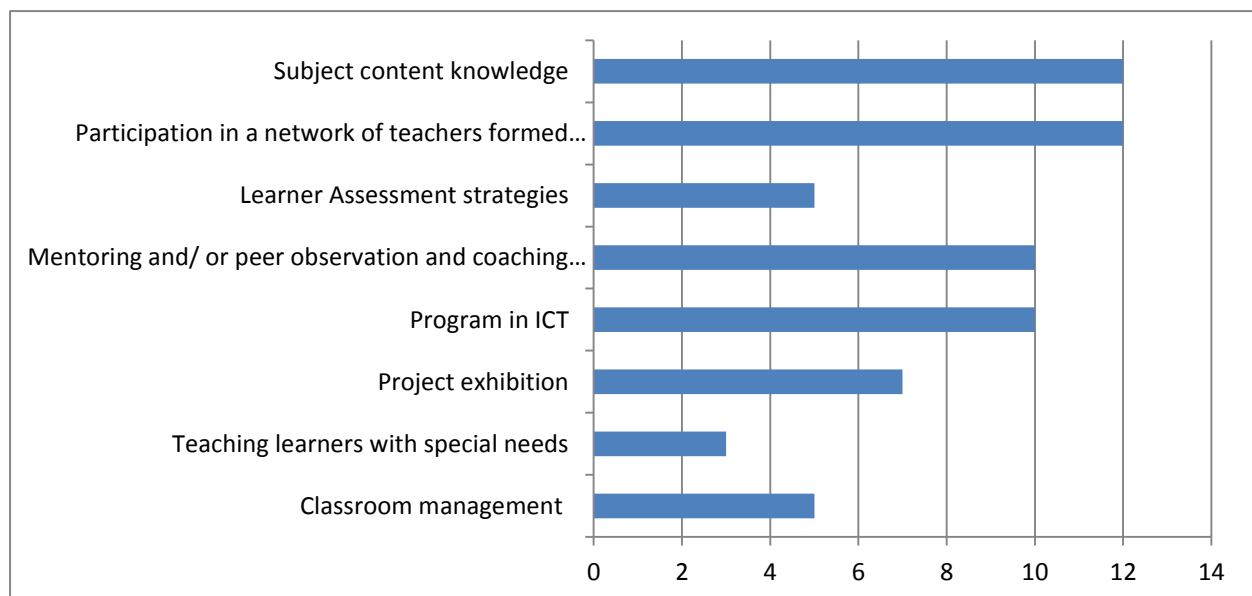
While a list of factors can be given that contribute to inhibiting teachers' participation in professional development activities such as the presentation of activities, the content focus, insufficient resources and personal factors, it is necessary for this study to identify the frequency of teachers' attendance to these activities. This will then guide the study to probe further as to which activities are of interest to teachers and the ways of teacher interests.

Teachers were asked to indicate their frequency of attending EDC activities and services. Encouragingly, the teachers have been participating in EDC programmes throughout their careers with nine of them for over five years. This reflects a good sample that could provide rich information regarding the importance of the provision of activities and services. However, a clear majority (10) of the sixteen teachers only attend them occasionally. The reflections of two teachers who 'always' attend EDC programme could indicate a need to probe into the reasons of those who are not attending.

**Table 4.5: Participation and attendance in EDC activities**

No. of teachers	Participation	No. of teachers	Attendance
1	7 years and more	2	Always
9	5-6 years	4	More often
3	3-4 years	10	sometimes
3	2 years and less	0	Never

The content of the activity affect the level of attendance at the sessions. Figure 4.2 below depicts the interest shown by teachers in different activities. Activities which were most attended were subject content knowledge and the networking of teachers probably in cluster meeting, about at an average of 12 teachers out of 16. These two activities are followed by the mentoring and/or peer observation and coaching as part of a formal school and the ICT program in which 10 teachers indicated to have shown interest.



**Figure 4.2: Teachers' attendance to EDC professional development activities**

The lowest attendance is depicted in the presentations for teaching learners with special needs, where only three teachers indicated to have interest and five teachers had interest in learner assessment strategies and classroom management concurrently. This finding could reflect that generic activities that do not contribute to the subject content are becoming less of interest to teachers. Almost half (7 out of 16) the number of teachers in the sample, have

interest in exhibitions, this again could be ascribed to the notion that not all teachers from the sample belong to the MST group which facilitates exhibitions.

Teachers were asked to indicate from various options what they would miss if the EDCs would be closed. The response that all teachers have something to miss from the possibility of the removal of EDC indicates that there are quality activities at the EDCs.

**Table 4.6: Significance of EDC activities for teachers**

No. of teachers	EDC activities
0	Nothing
9	Education Network
11	Content Enrichment
7	Skills development

Table 4.7 indicates that nine teachers would miss education network. This activity is associated to teacher collaboration that permits teachers to share experiences and ideas. A large number (11 of the 16) of teachers indicated that they would miss the content enrichment training which according to Whalan (2012), fosters acquisition of content knowledge. Both education network and content enrichment activities form part of Guskey's (2000) key features to evaluate the effectiveness of professional development. Only seven teachers would miss the skills development activities that allows for active participation and forces teachers to perfect the skills they have learnt. Both subjects chosen for this study require the mastering of hands-on activities.

#### **4.3.3.2 Type of professional development**

Teachers were given activities to indicate if they participated or not for the past two years and the frequency of their participation (Table 4.8). From four specified activities, teachers had to indicate in which of the workshops/training sessions organised at the EDC they had participated. A large number (7 of the 16) of teachers attended the monthly training events. This is a good response especially as not one respondent indicated never attended any training activity.

**Table 4.7: EDC activities and services attendance**

No. of teachers	EDC activities and services	Once a year	Twice a year	Quarterly	Monthly	Never
9	Borrow equipment/material	6	3	1		7
13	Cluster meetings	2	3	3	5	3
13	Visit exhibitions	7	4	2		3
16	Workshops/trainings session		4	5	7	

Although most (12 of the 16) of the teachers visited the exhibitions at the EDC, only four teachers attend exhibitions twice a year. According to an explanation from the Physical Science facilitator, the EDC arranges two science exhibitions known as EXPO for Young Scientists and these are the district and the provincial exhibitions. It would seem that most teachers (7 of the 16) attend the district exhibitions and four teachers from the sample proceed to the provincial exhibition. However, two teachers indicated to have attended quarterly, which could mean that some teachers also attended the national exhibitions. Apparently, teachers who are not involved in Physical Science subjects do not participate in exhibitions. Probably, there are teachers who felt obliged to expose learners to this activity in return for receiving good classroom projects as a form of curriculum assessment.

The cluster meeting are attended by thirteen teachers which is a good response taking into account that it is organised by teachers themselves. Only three teachers did not attend these meetings, and this could be explained by either not receiving information or they might have felt that the activities did not meet their professional development needs. However, since cluster meetings take place parallel to other training, teachers seem to have to divide their loyalty by choosing one or the other meetings on offer.

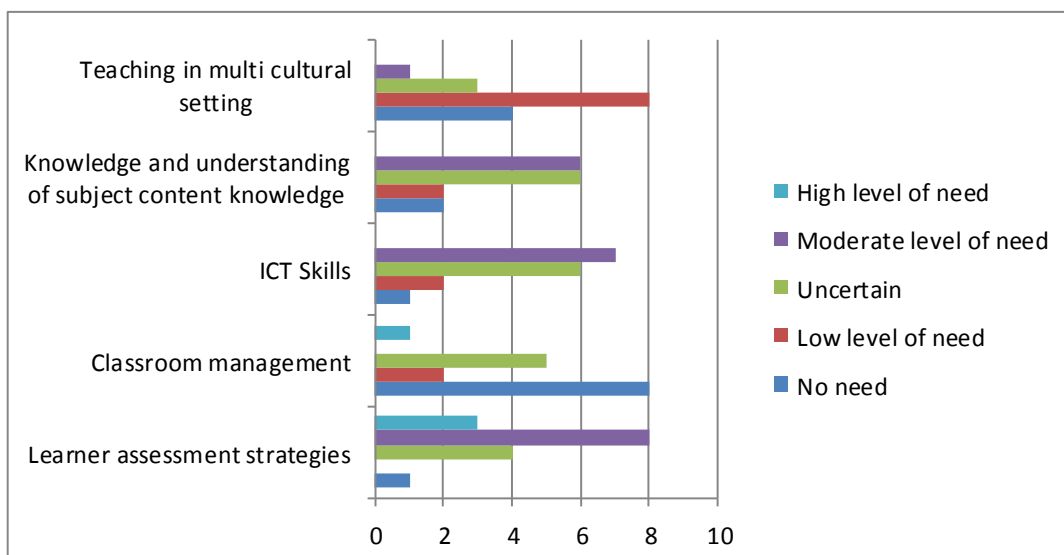
Only nine teachers borrow equipment or material from the EDCs. This result is contrary to the expected response as it was thought that participation in this activity would be high since most schools in the sample are from the disadvantage areas. Citing this teacher, it would seem that teachers have lost interest of checking the availability of material they need as cited:

*“the EDC seems to be only a building for meetings, every time I go to loan certain equipment it is not available.”* (Teacher-I, August 2012)

Limited equipment and material at the EDCs seemed to be a dominant problem. This was evident through the retrieval register noted from the administrator when the procedure followed for loaning equipment was explained. The system used at the EDC does not seem to be well structured. The EDCs did not have a stock register to indicate what they had, what was loaned or used and what was left. In addition, the equipment was not identified according to a structured system to ensure easy retrieval and replacement.

#### 4.3.3.3 Areas of developmental need

However, although some improvement was evident in the teachers’ mastery of different skills and their acquisition of knowledge from the simulation of projects and cluster meetings, there was still a need in other aspects of learning (Figure 4.3).



**Figure 4.3: Teachers' areas of developmental needs**

- **Teaching in multicultural setting**

The analysis reflects that a majority of teachers do not need development in ‘teaching in multi-cultural setting’. This could be ascribed to the fact that there is one dominant culture in all the schools in the area. Only one teacher indicated a moderate level of need, which could be one of those schools near the Swaziland or Mozambique border. Even-so, this activity does not place an emphasis on subject content that has previously obtained a negative response.

- **Knowledge and understanding of subject content knowledge**

A limited number of teachers (6 of the 16) indicated a positive response towards a need for knowledge and understanding about the subject they were teaching. This again informs the planning of professional development around the subject knowledge. Very few teachers (4 of the 16) reflected a negative response towards the need of knowledge and understanding of subject knowledge. It could be a concern that 6 teachers are not certain if the need knowledge and understanding of subject content or not, which necessitate the use of pre-assessment before the restructuring of activities.

- **ICT skills**

An average of seven teachers felt that their need for re-skilling in ICT was at a moderate level. This could be the result of technological advancement coupled with the concept of assessment for learning. Only one teacher indicated no need and six teachers uncertain. The uncertainty could result from the doubt of not having computers and internet connectivity.

- **Classroom management**

The analysis revealed a high negative response towards receiving instruction about classroom management, an issue five teachers were uncertain about, and two teachers registered a low need and eight teachers had no need at all. Classroom management refers to a variety of skills and techniques aimed at keeping learners on tasks, attentively orderly and academically productive during a classroom lesson. Although research has shown that classroom disciplinary problems have significant effect on the lesson presentation, the reflection from this analysis is that teachers have no need for this development.

- **Learner assessment strategies**

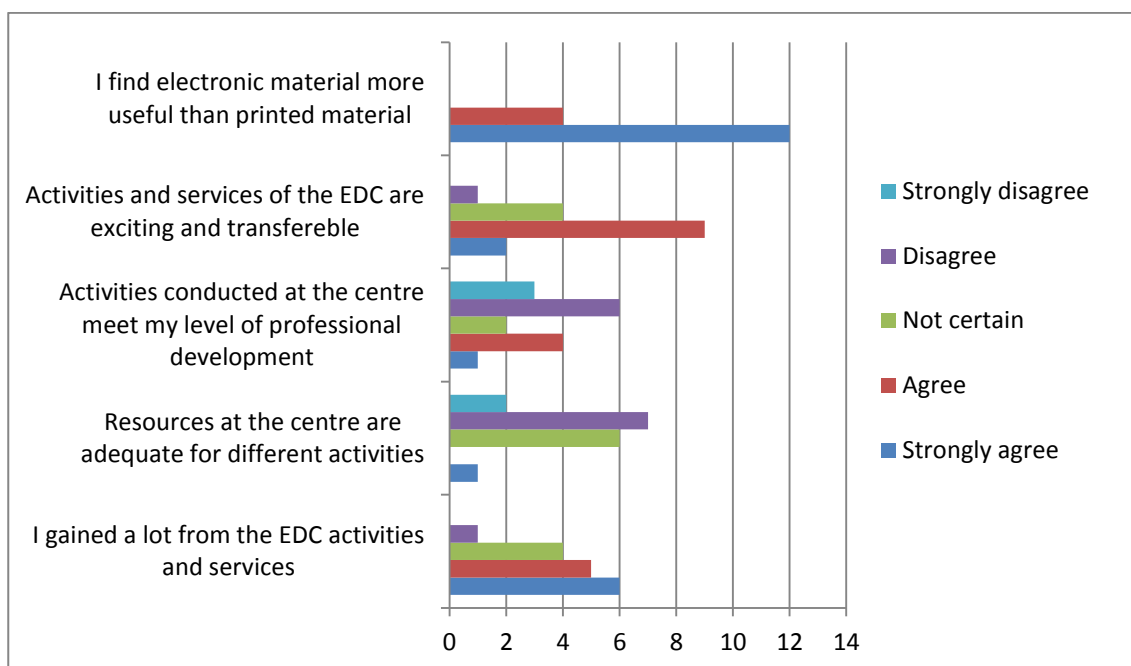
The results depict an average number of teachers with a positive response towards the need of extending their knowledge about learner assessment strategies. Assessment strategies are critical to assisting teachers which adjusting subject content to match teaching strategies. Very few teachers (4 of the 16) indicated to be uncertain about their need for further development regarding learner assessment strategies.

In summary, three areas are identified for further developmental need: ICT, learner assessment and knowledge and the understanding of subject content. All three areas support teaching practice. These findings reveal that development is still needed for teachers until

future research shows there is no longer need for development or that only a minimal need exists.

#### 4.3.3.4 Exploring teacher attitude

The teachers’ reaction to specific EDC activities and services was investigated according to the attitudes they adopted. The teachers were given different prescribed statements to indicate the extent in which they agree with them by choosing ‘strongly agree, agree, not certain, disagree and strongly disagree’ (Figure 4.4).



**Figure 4.4: Teachers' reaction towards EDC activities and services**

- **I find electronic material more useful than printed material**

Almost all teachers find the use of electronic material more useful than printed material with twelve teachers who strongly agree with this statement. Although a textbook has been a basic component in keeping information, today’s technology is appearing to bypass printed material. More importantly is the point that even the facilitators would appreciate the provision of electronic tools for easy planning and the facilitation of activities. Centre managers promoted the use of the Modlin Question Bank program for teachers to structure their own tests (Section 4.3.1). This program necessitated having the ease-to-develop standardised question papers while benefiting from the fact that alterations are easily effected in text that is in electronic format.

- **Activities and services of the EDC are exciting and transferable**

Effective professional development activities focus on the transferability of new knowledge and putting skills into practice (Whalan, 2012). It is noted that nine teachers agreed that activities and services of the EDC are exciting and transferable while only four teachers were 'not certain'. This could be a result of activities not being transferable due to inadequate resources and lack of Internet connectivity in the school situation.

- **Activities conducted at the centre meet my level of professional development**

More than half (9 of the 16) of the sampled teachers did not agree that the activities conducted at the centre met their level of professional development. This prompts the execution of another study to delve into the teachers' direct needs with regard to their professional development. A small number (5 of the 16) of teachers agreed that activities did meet their level of professional development and two teachers were not certain.

- **Resources at the centre are adequate for different activities**

Again, more than half (9 of the 16) of teachers did not agree that resources at the centre were adequate for different activities. Almost all responses confirmed that the EDC resources are insufficient and this has a negative effect on the quality of EDC activities and services. It is also noted that six teachers were not certain about the adequacy of resources.

- **I gained a lot from the EDC activities and service**

According to the responses, nine teachers agree that they gained a great deal from the EDC activities and services. This was confirmed by the facilitators when assessing the teachers' portfolios. Programme developers find this encouraging as the activities provided were appreciated by the teachers. Only one teacher had a negative comment and four teachers were undecided about the impact of EDC activities and services.

#### **4.3.3.5 Outcomes of Professional Development Activities and Services**

Although the study focused on process evaluation, it is significant to assess the extent to which the EDC activities and services are achieving the envisaged outcomes. These outcomes stem only from the short-term changes that result directly from the current activities and



services. Computer skills, lesson presentation, hands-on activities and increase in content knowledge have been identified as the main outcomes attained.

- **Computer skills**

Training in basic computer skills is noted as the one major activity in both EDCs. One would expect a large number of teachers to have acquired computer skills. Yet, only nine teachers were identified as having acquired formal computer skills. Only two teachers indicated not having access to a computer which does not necessarily mean that they do not have computer skills (Table 4.9). Of all the teachers, five had access to computers at their schools and four teachers had access to computers at the EDCs. A small number (3 of the 16) of teachers could access a computer at home and this call for more computer initiatives that were at one time initiated by the Mpumalanga Department of Education. For teachers to access computers at the commercial centres reflects a dire need for urgent attention to be given to drive another computer initiative. It is seen from this table that teachers in one way or another have means to reinforce their computer skills by having access to a computer.

**Table 4.8: Teachers' access to a computer**

No. of Teachers	Access to a Computer
3	Home
5	School
2	Commercial centre
4	EDCs
2	None

The Computer Science facilitator is in agreement with Centre-manager-B that most teachers have acquired basic computer skills. This is confirmed by the level in which training is taking place as explained by the Computer Science facilitator:

*“the second level (of computer training) is the intermediate, wherein teachers must know how to e-mail, down-load, then the third level is the advanced level, which entails integration of subject.”* (Computer Science facilitator, July 2012)

The centre manager at EDC-A also stressed the emphasis on computer training. As a means of reflection on computer skills, the science programme necessitated that teachers be competent in computer skills to be able to simulate specific content knowledge. Again, the

program on item development requires competent computer users. The computer facilitator encouraged teachers to bring along their laptops to training sessions to ensure smooth facilitation. He further explained how he trained teachers:

*“I first install the CD on their laptops then using a data projector I therefore explain to them how to download programs. Together we work with the simulation activities. Those without laptops they have to share with friends. They get the program with a USB from their colleagues.”* (Computer Science facilitator, July 2012)

The Computer Science facilitator explained where most teachers were falling behind and what retards the progress in the training of computer usage and he said:

*“Most teachers have acquired the basic skill which is level one, but then there is a great challenge to move to the next levels, which is level two and three - the second level is the intermediate, wherein teachers must know how to e-mail, download, then the third level is the advance level, which entails integration of subject.”* (Computer Science facilitator, July 2012)

- **Lesson presentation**

Lesson studies has not ceased since its initiative by the JOVC. Though the Science facilitator indicated that lesson studies take much of teachers’ time, at least one presentation could be planned in a year. The processes of lesson studies has also been emphasised by the centre managers in consultation with the management team. Such an activity trains teachers to plan, present and gain content knowledge.

- **Hands-on activities**

In addition to the computer skills, teachers learnt the skills of conducting practical work. The Physical Science facilitator explained that he noted an improvement in the practical work aspect in the teachers’ portfolios during moderation and assessing the learners’ workbooks. Moreover, he initially indicated that practical work was the gist of their workshops since most schools are challenged by the use of equipment and do not do practical work in the classroom.

- **Increase in content knowledge**

Cluster meetings and workshops conducted by the Physical Science facilitator are reported as increasing the teachers' content knowledge. When asked about the effectiveness of the workshops, he said:

*“Teachers are now confident in doing practical work through the experience they received from the workshops and this is evident from the learners' books. There is much improvement on the new content knowledge and the quality of moderated work has improved. More practical work is given to learners.”* (Physical Science facilitator, July 2012)

The Physical Science facilitator further explained that the workshops he normally provided to teachers are mostly content based and includes experiments.

The findings of attendance at most activities also confirms that teachers are benefiting from the EDC activities, although only one teacher previously indicated (Figure 4.4) that activities did not relate to his professional development.

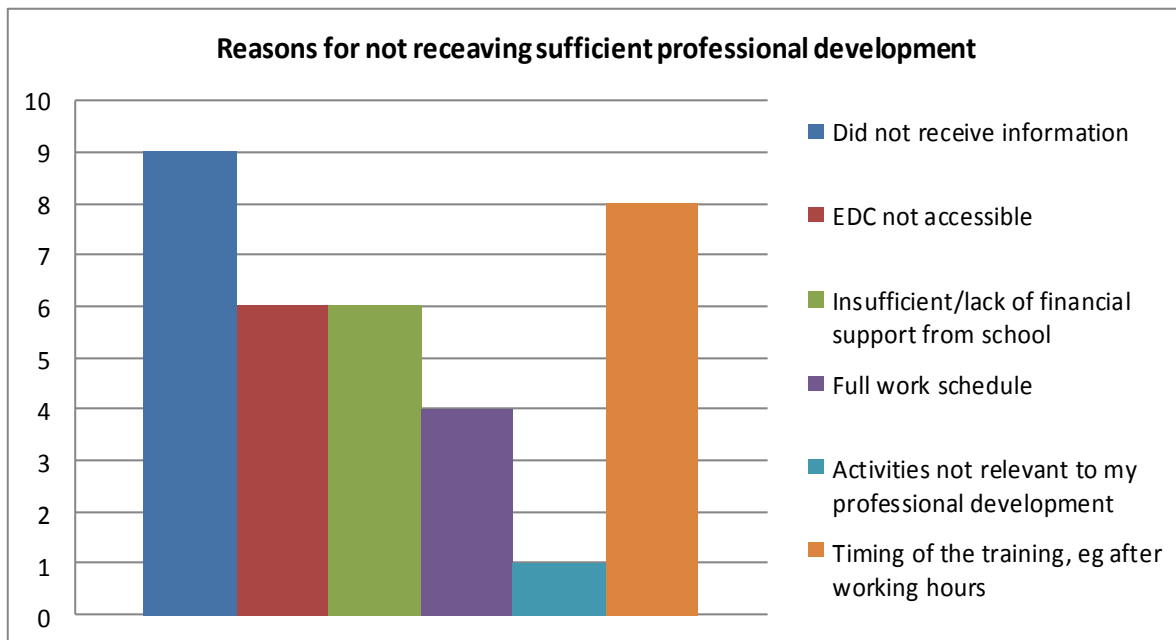
*“Teachers are now confident in doing practical work through the experience they received from the workshops and this is evident from the learners' books. There is much improvement on the new content knowledge and the quality of moderated work has improved. More practical work is given to learners.”* (Physical Science facilitator, July 2012)

#### **4.3.4 Barriers to Professional Development**

To understand the availability of professional development opportunities and teachers participation in activities to enhance their own professional development, the study asked teachers if they had participated in sufficient professional development activities the past 24 months. More than half the sampled teachers (9 of the 16) indicated that they felt they had not experience sufficient professional development. Teachers were then asked to indicate reasons that best explained what prevented them from enhancing their professional development. Teachers were allowed to choose as many of the options as were appropriate (Figure 4.5).

The most common reason cited was “did not receive information’ (9) and the ‘timing of the training, e.g. sessions being held after working hours’ (8). Equal number of teachers (6) indicated that the ‘EDC is not accessible’ and ‘insufficient/lack of financial support from the

school’. Only four teachers indicated having a ‘full work schedule’, while one teacher regarded the activities offered at the EDC as not relevant to his professional development.



**Figure 4.5: Reasons for not receiving sufficient professional development**

- **Did not receive information**

The number of teachers who did not receive information seems to be the most common reason for non-participation. One of the reasons that lead to teachers not receiving information could be the discontinuation of the newsletter. Centre manager-A cited the budgetary constraints as one of the reasons for discontinuing with the issuing of newsletter (Section 4.3.1.2). Again, the facilitators relied on the circuit offices to distribute the invitations to EDC training. No mention was made of an annual EDC programme being sent to schools except the one about clusters. This means that the EDCs do not have a standing programme with a series of activities and implies that a rather unstructured system of activities the way the centre functions.

- **Timing of the training, e.g. after working hours**

Half of the teachers cited the timing of training as a barrier to participating in professional development opportunities. The facilitators confirmed the drawback; responses acknowledged that the attendance at events held after working hours was good but the duration and the state of teachers after a full day’s teaching programmes contributed to the ineffectiveness of the training. Teachers are either exhausted, arrived at the training venue late or they were eager to get home as soon as possible to attend to household commitments.

This could imply that to negotiate an appropriate time with teachers would be beneficial, particularly as the teachers need to have time and be given an opportunity to reflect on their practical skills to maximise the effect of the input and consolidate what they had learnt (Section 4.3.2.1).

- **EDC not accessible**

In spite of the EDCs being situated next to the main road and in the community, fewer than half (6 of the 16) the number of teachers felt that the EDCs was not accessible. Accessibility could be in terms of time not distance. One teacher explained the challenges he experienced during the schools hours when the Physical Science facilitator is not available at the centre because he is not centre-based, and the centre administrators do not know about chemicals, as it is not their field of expertise. The Physical Science facilitator confirmed that the administrators phoned him to get information about the material and resources to be loaned during his absence from the centre.

In trying to counteract the challenges posed by teachers finding it difficult to cover the distance to the centre, Centre manager-A indicated he conducts workshops for a cluster of teachers near their workplace.

- **Insufficient or lack of financial support from the school**

In addition to the EDC not being accessible, the same number (6 of the 16) of teachers claimed that they get insufficient financial support from their respective schools. While some schools do provide teachers with transport costs to attend the EDC training, this is not the case in all schools. However, teachers themselves should be motivated to attend workshops, as this is a vital prerequisite for successful enhancement of their skills.

- **Full work schedule**

It was noted that only four teachers indicated ‘full work schedule’ as a barrier to participating in extra activities that would promote their professional development. This would tend to imply that the scheduled time for events was either inappropriate or not well aligned to the type of professional development that would meet the teachers’ needs.

- **Activities as not relevant to professional development**

Interestingly, only one teacher regarded EDC activities as not relevant to personal professional development. This is a positive finding as it confirms the point that irrespective of the external factors, the activities themselves should stand alone as relevant and appropriate to the enhancement of the participant's professional development. Activities which are not relevant to teacher professional development are those that cannot be ascribed to being classroom related or accommodating the need of individual teachers, since the definition of professional development will vary from person to person as the Code of Professional Ethics illustrates.

#### **4.4 CONCLUSION**

This chapter presented the data and its interpretation partly referring to the literature review to address the main question on the quality of EDC activities and services. Responses from different data sources were not presented in isolation but they complemented each other. A systemic process evaluation of the EDC activities and services was conducted guided by the logic model to ensure that all elements to be evaluated were captured. This means that appropriate information was collected using critical questions and then analysed thus providing an opportunity for interpretation to inform future design and improvement of the EDC programme.

What comes clear in this study is that the quality of a particular type of professional development activities and services depend largely on their design and the organisational support to effect changes on teachers. A variety of activities and services can be effective if they are designed to incorporate the researched based key features and aligned with the organisational context and vision.

The next chapter summarises the dissertation with reference to the research questions and reflection on the methodology and the use of the logic model as a conceptual framework. Chapter 5 further puts forward the limitations and significance of the study and addresses the ways to use the information by offering recommendations and suggestions for further research.

## CHAPTER 5

### SUMMARY AND RECOMMENDATIONS

#### 5.1 INTRODUCTION

This research was motivated by a need to explore the extent to which education development centres (EDCs) are providing quality activities and services to enhance effective teacher professional development. The study was guided by the research question: **How do EDC activities and services in Mpumalanga enhance teacher professional development?**

To sum up, Chapter 5 sought to:

- provide a summary and objectives of the study (Section 5.2);
- provide possible answers to the research questions (Section 5.3);
- provides a discussion of the conceptual framework (Section 5.4);
- provide a summary of the research design and methodology (Section 5.5);
- present the summary for the chapter (Section 5.6);
- offer possible recommendations (Section 5.7); and
- provide a conclusion for the study and possible further research areas (5.8).

#### 5.2 SUMMARY OF THE STUDY

EDCs in Mpumalanga province were designed primarily to organise, provide and coordinate ongoing support and professional development for teachers. This study evaluated the quality of EDC activities and service in pursuit of enhancing professional development of teachers. The purpose of this evaluation was:

- to identify the activities and services offered at the EDCs;
- to determine the underlying principles through which the activities and services are developed and explore the EDC context;
- to assess the content of EDC activities and services; and
- to assess teacher perception towards EDC activities and services.

The main research questions that guided the study were:

1. *What professional development activities and services do EDCs provide?*
2. *What is the rationale behind the development of EDC activities and services?*
3. *What is the quality of EDC activities in relation to the professional development of teachers?*
4. *What are the teachers' perception of EDC activities and services?*

### **5.3 DISCUSSIONS OF RESEARCH FINDINGS PER RESEARCH QUESTION**

The approach and content of South African education is changing so is what is expected of EDC activities and services to meet the teachers' needs. EDCs, therefore, should prepare teachers for all the challenges they will face by creating opportunities for re-skilling and equipping teachers with knowledge in order to maintain a high-quality teacher workforce. To examine these issues, this study evaluated the prevalence of quality activities and service from the stance that quality activities and services should embrace content to increase teacher SCK and PCK and provide opportunity for participation (Laine, 2011). These issues are discussed as the research questions:

1. *What professional development activities and services do EDCs provide?*

While the provision of professional development activities and services has been critiqued across the education system, there is limited consensus on the intervention strategies for teacher professional development. EDCs in Mpumalanga offered various programmes with the sole purpose to develop teacher practice. The activities are cluster based, district based, centre based and some activities are directives from the Department of education.

As per the focus of the study, the identified activities included workshops on science content and practical work on experiments and training on computer skills. Most of these activities required teachers to be hands-on which exposed teachers to the opportunities to use various tools, techniques for self-reflection, access to existing knowledge and improved competency in professional practice of skills in the field of education. Apart from enhancing teacher practical skills, the workshops were led by experts with an intention to solve classroom problems (Section 4.3.5). The introduction of ICT was seen as a move to developing skills



and improving the quality of teaching and learning particularly when downloading programmes, developing items from the computer and simulating science experiments. Nonetheless, the limitations of resources forced teachers to work in groups but it had the positive effect of collaboration and improvement of partner-work.

Although centre managers are not subject specialists, they distributed subject content clips from magazines or newspapers to schools. Programmes from the national and provincial office of education were also facilitated by the centre managers since the EDCs do not have centre-based facilitators. Programme includes computer item development, Code of ethics and the lesson presentation. However, the cascading of these activities to teachers is very slow and at times not practical since presentations is done to the SMT and CMT for further cascading.

Teacher collaboration has been effective through the lesson study, which was organised by the clusters with little assistance from the subject advisor. Although this activity took most of teachers' time with several stages of planning and preparing one lesson, it improved their lesson presentation skills class management and approach to handle difficult concepts. Again, clusters used the pedagogic space provided by the EDCs for other meetings and it was in this space that teachers learnt from each other and shared experiences.

EDCs are known as resource centres and even though they had limited resources teachers still visited the EDCs to borrow equipment and resources for use in their teaching.

## *2. What is the rationale behind the development of these activities and services?*

Professional development is a complex activity strongly shaped by the context in which it is delivered. The professional development activities and services are shaped by multiple factors focusing on changing teacher practices such as factors influencing teacher knowledge. Notwithstanding the influence of external factors such as teacher perception and limited resources, teacher professional development is strongly influenced by teacher willingness to engage in professional development.

Therefore, it is significant to set conditions that are responsive to the ways in which teachers learn. The study identified the following as important to deliver quality professional

development activities and services: realistic vision based on meaningful curricula content and different pedagogical approaches, promoting teacher collaboration that focuses on teachers' needs and integration of knowledge and skills that make significant changes to the teacher practices. Approaches in these activities were provided in cluster meetings, computer lessons and workshops.

However, collegial planning and designing of activities was limited to only activities that comes once in a year such as Expo for Young Scientist and the Science Fun activities. Involvement of teachers in the designing of activities could assist in designing activities and services that could meet teachers' needs. However, the study contains examples of situations where teachers were given time and resources to meet together, learn about new content knowledge or develop practical scientific and computer skills. This is evident that some activities were designed for collegial interaction that focused on teacher needs to interact new learning to existing teacher practices.

Although the centre managers have indicated they are guided by the EDC vision and mission to draft their own activities to support schools, the key performance indicators (Table 4.3) revealed some challenges in complying with the EDC vision and mission. The reason these challenges could be associated with the limited resources and the financial constraints. Additionally, the lack of resource supply accompanied by costs does not bode well for the Department of Education's image, especially when noting that the Department are financially responsibility for the EDCs. Although EDCs had its limitations, the designed activities and services were aligned to the available resources and equipment.

*3. What is the quality of EDC activities and services in relation to the professional development of teachers?*

The evaluation of the quality of EDC activities and services was conducted using the key features of effective professional development programme (Haslam, 2008), namely: reform, content-focus, coherence, duration, active learning and collective participation. The study revealed that few features of quality are prevalent in the professional development activities provided in the EDCs.

Table 5.1 below shows the extent to which four types of professional development activities have or could have characteristics of quality professional development. Each row represents a different type of activity while each column represents key features to produce quality professional development activities. A “Certain” in a cell implies that the type of activity has the key feature under discussion while “By design” means that the activity could have the key feature if designed and implemented with that feature in mind.

**Table 5.1: Comparisons of the quality professional development activities**

Activities	KEY FEATURES					
	Reform type	Content focus	Coherence	Duration	Active learning	Collective participation
Workshops	By design	By design	By design	By design	By design	By design
ICT program	Certain	Certain	By design	Certain	Certain	By design
Lesson presentation	By design	Certain	By design	Certain	Certain	Certain
Cluster networking	Certain	By design	By design	Certain	By design	Certain

The table depicts that the merit of a particular type of a professional development activity largely depends on its design. These activities can possess the quality to enhance teacher professional development if they are designed to integrate research based features and are aligned to the organisational vision, contexts and goal.

EDCs are likely to achieve quality professional development activities if they use such alignment and include their teachers in their planning and engage in the process of improvement such as using performance indicators. Teacher involvement in planning for professional development activities is a significant strategy associated with effective professional development.

#### *4. What are the teachers' perceptions of EDC activities and services?*

Teachers seem to attend the EDC activities occasionally but more specifically, seem to value the training sessions which are subject-specific. The most attended sessions are those that deal with SCK as well as the cluster workshops focusing on lesson study and computer

literacy. Teachers who received professional training on computers appraised the programme on its support to reaching teaching objectives, for example, developing items, simulations and accessing educational programmes. However, the Internet connectivity posed a threat in accessing information and downloading programs. The discontinuity of Internet services led to a serious disengagement of teachers with EDC services (Section 4.3.1.2).

Even though teachers indicated to have attended the cluster workshops, there was a challenge of disseminating information to schools which contributed to teachers not receiving professional development. The only means of disseminating information to schools was through the circulars sent through the circuit office. In this way, circuit managers could not trace whether the circular reached all target group. The workshop which had maximum participation was the cluster workshops since programmes were developed by all teachers and covers the whole year.

As noted before, the timing of the workshops seemed to have a negative effect on teacher attendance at EDC activities. Usually activities are scheduled for two-hour sessions after school hours while teachers are either exhausted after a full day's teaching or, due to public transport and distance from the centre, they arrive late and leave early shortening the workshop duration. The workshop or training sessions are too short and do not provide teachers with an opportunity to reflect and consolidate on what they have learnt.

Although EDCs are strategically established to provide schools with resources particularly to the under-resourced schools, teachers were discouraged by both the inadequate resources and the lending system of the equipment in place at the EDCs. The indication from teachers that it is unlikely that they get assistance with provision of the appropriate chemicals and equipment during school hours because the facilitators are not at the centre and the administrative clerks are not knowledgeable in the Science field. Because of the unavailability of chemicals and the shortage of resources, some teachers had only made use of the EDC lending system once during the year.

Teachers contend that as some of the professional development activities are top-down interventions dictated from higher levels of authority, they often do not cater for their needs. Even if activities are transferable, for example, the hands-on Science experiment and the

development of items, it seems that these workshops and sessions are impractical for their context particularly where there is limited follow-up support and resources.

### A. REFLECTION ON THE CONCEPTUAL FRAMEWORK

The logic model (Table 5.2) was developed as a conceptual framework to guide the evaluation of EDC activities and services, and reveal the nature of the EDC activities and the significance of their derivation. The framework successfully assisted in the planning of the evaluation, clarifying what was to be evaluated and identification of gaps that hinder the development of quality activities and services and clarified the assumptions.

The Logic model below portrays the chain of reasoning that links the input to the outcome. The EDC vision and mission which set the focus of EDC were sought to be evaluated as the priority elements. The key performance indicators were evaluated against the mission statement and against the actual activities and services offered at the EDCs. The structural features under the input component were also evaluated as organisational factors that support the implementation of activities and services to bring change. These features were evaluated against the elements of sufficiency and efficiency to support the activities and services under the output component.

**Table 5.2: Logic model as a tool for program development and evaluation**

Priorities	Inputs	Outputs		Outcomes		
Mission	Structural	Activities/Ser	Participation	Short-term	Medium-term	Long-term
Vision	Features	vices				
Key	Staff	Workshops	Teachers	New PCK and	New	Professional
Performance	Time	Presentations	attendance	SCK	knowledge	development
Indicator	Material	Study groups	and		and skills	
	Resources	Exhibition	participation	Improved	Effective	
	Equipment	Loaning		skills	teaching	
	budget	Training		Teacher	practice	
		Meeting		perception		
<b>ASSUMPTIONS AND CONTEXTUAL FACTORS</b>						

The actual implementation of different EDC activities and services, including their development were not observed during the course of the study. However, as part of the inputs

of the model, note was taken of the resources available in each of the EDCs. Inputs are vital to achieve the outputs and the outcomes, and in the context of this study, it was not possible to evaluate the medium and long-term outcome. The medium-term outcome needed an onsite observation in schools which was not possible for this study while the long-term outcome which is the ultimate effect of the programme also was not practical to achieve.

This study focused predominantly on the outputs and relied on the self-reported information collected from the participants during their participation in the activities and the use of the EDC services. Findings emerging from this section assisted in determining the quality of these activities and services, following a monitoring and evaluation role. During the data gathering the external factors could not be ignored as factors that contributed to the implementation of activities and services, for example, staff availability and resources availability.

The study validated the assumptions that were made in Section 2.6, when the conceptual framework was developed as follows:

- Inadequate material, equipment, facilities to ensure full participation;
- No full time facilitators to ensure full participation;
- Time created to ensure full participation;
- Inadequate funds to ensure full participation; and
- Activities and services bear potential to enhance professional development.

The study saw a variation in the assumptions made with the exception of the provision of activities and services that have potential to enhance professional development of teachers.

#### **5.4 REFLECTION ON METHODOLOGY FOR THE STUDY**

The use of qualitative mode of inquiry proved to be helpful during the collection of data in which the framework for the interview questions allowed participants to provide their views accurately and thoroughly without being restricted. Themes were raised by participants who were not in the framework which allowed probing for more details. The framework further provided understanding of the evolving programme from the facilitators and the centre managers, point of view. The qualitative interviews with the centre managers as key

participants to unfold the EDC programme, helped in documenting the variety of EDC activities and services, the implementation processes and the progress towards the outcome.

The purposive sampling of two EDCs ensured that limited data is obtained from the centre managers. Although the study could not allow for the generalizability, it was easy to do member-checking with only four participants to ensure credibility. Again, the face-to-face interviews provided in-depth information which could not have been obtained through telephonic conversation or questionnaire, particularly for these centres which are located in disadvantaged areas with poor telephone signals.

Although the use of a qualitative approach to programme evaluation yielded interesting outcomes, the use of a mixed method study could have provided more depth and addressed a range of relevant aspects during the initial phase of the investigation. This would have meant planning a full qualitative and quantitative study to legitimate the use of multiple approaches in answering the research questions, rather than restricting the different choices (Maxwell, 2013). The adjustment to the research approach and incorporating proposed mixed methods might have made it possible to explore the phenomena against more than one perspective. For triangulation purposes, phase one of the study could have been a quantitative study to identify the teachers' need for professional development. From this data it would have been easier to purposefully select participants for a qualitative study as additional clarity on certain aspects that would be forthcoming. The use of questionnaires to provide such numerical data could then be supported by focused group interviews.

From the sampling, the study failed to secure the participation of the EDC coordinator from the Head Office. In several telephonic conversations, the coordinator indicated that he was already committed and referred the researcher to the Centre Manager-A as an informational person hence he became part of the sample mainly to provide background information on EDCs about EDCs. However, the even distribution of teachers from different schools complemented the data though the sampling of teachers would have been appropriate if it was done after the analysis of a number of teacher questionnaire responses.

The greatest shortfall of this study was the failure to observe the interactions of teachers during the activity presentations, which led to the abandonment of the semi-structured observation tool. EDC activities were not consistent or planned in advance. As a result, the

active participation and teacher collaboration was not observed to have provided a true reflection of teacher inter-action. So, it was not possible to determine the extent to which a participating teacher had acquired new knowledge and skills. Focus group interviews which allow freer and less formal group discussion could have complemented the data but it was not possible to bring teachers together. However, the field notes which were updated during each visit assisted in the reflection of EDC activities and services. To verify data obtained, informal teacher interviews were done while collecting responses through the questionnaires.

Although numbers are not often used in qualitative studies, they were useful in this study to complement the overall process of orientation to the substantiated by the following advantages as guided by Maxwell's (2010) work, in that the technique:

- Contributed to the internal generalizability of a qualitative research claim, and
- Provided systematic evidence for diversity of perceptions that may be overlooked by both the evaluator and teachers as respondents.

Most importantly, numbers do make a report more precise, rigorous and scientific without misrepresenting the actual bases for the conclusion. The study was then attuned to open-ended questions aimed at uncovering the processes in which EDC activities and services were delivered, establishing change efforts and determining relationships between the input and the outcome.

Although it was not the intention of the evaluation process to compare or contrast activities between the two EDCs, it was hoped that some common findings and understanding would arise based on recurring common themes. However, given the different contextual factors coupled with the different activities provided for teachers, it was difficult to bring these results to the level of analysis for broader generalisation. However, in bringing together individual activities, a rich description of data is formed.

While attempts were made in the selection of the data collection instruments to include a variety of data sources to probe deep-rooted information, having only the four instruments limited the scope of searching for diversity.



## **5.5. MAIN CONCLUSIONS EMANATING FROM THE STUDY**

While this study has detected some effectiveness in the EDC activities and service, it has at the same time identified aspects which contribute to the hindrances of offering quality activities and services for the EDCs. Given the professional development of teachers as the goal of the study, the quality of activities and services is linked to the mastery of knowledge and acquisition of skills and embraces the relevant content to meet teacher emerging needs (Laine, 2011). The development of teacher activities and services should be informed by the curricula and instructional activities that are known to deepen teachers' subject knowledge, at the same time, sharpening their teaching skills to maintain this advancement throughout their teaching career.

### **5.5.1 EDC support can effect change**

For the quality activities and services to produce quality outcome, implementation and learning environment should also be of quality (Sharma & Karma, 2006). The factors that impede the implementation of quality activities and services focused on the alignment of the programme to the EDC vision and mission. The EDCs do not have adequate physical resources and human resource to implement these activities and services. The EDCs in the study need to strategically align themselves to the resources they have and provide appropriate development to teachers.

Additionally, the management presented disjointed activities which could not give clear objectives of the EDCs. EDCs should be conceptualised adequately (Siddique, 2008) and perform a specific purpose. The EDCs in this study were found to be multi-functional, that is: promoting professional competency through workshops in sciences and in computer literacy, serve as a resource centre for the catchment schools and provide pedagogical space for meetings.

### **5.5.2 The nature and quality of EDC activities and services can support professional development**

The nature and quality of the EDC activities and services were found to support effective professional development. Most of the activities embraced the relevant content to achieve the

goal of professional development particularly in mastering of subject content knowledge and acquiring skills through simulations, practical work and demonstrations and pedagogical knowledge and also provided opportunities for active participation.

### **5.5.3 Positive reaction to EDC activities and services**

The study established that teachers react positively to the content of activities and services that address their classroom needs. It is therefore vital to ensure that activities and services are systematically developed and planned taking into account teacher needs. This, however, calls for a close collaboration with teachers so that they are part of planning processes for the activities that affect their practices. Collegial planning of EDC activities with teachers increases synergy leading to the development of quality activities and services. Hardy's (2012) argument calls for the adoption of new strategies for classroom practice and which requires teacher involvement in the planning stages of activities and services. This would help alleviate appropriate activities and top-down decisions (Rodrigues, 2005). Megginson and Whitaker (2004) suggest that teachers must be responsible for their own learning, decide on their learning needs and how to fulfil them. Taking professional development as an integral part of work will make the development effective rather than taking it as an additional burden.

## **5.6 RECOMMENDATIONS**

Based on the conclusions drawn for each research question, improving the quality of EDC activities and service is vital not only for the betterment of teacher practices but also to ensure that the education system receives the best investment possible. The study therefore put forward the following recommendations:

1. The concept of education development centre was explored with the intention to develop teacher knowledge and skills. It would seem like the concept needs further attention as to the operationalising the activities, funding and personnel to realise the vision of the centre. Already the province has an idea of an ideal EDC from the officials they sent to Japan. The focus for EDCs is to provide educational development activities to support teacher practices and this could be realised if a team

of educational specialist could analyse teacher needs, understand and align the needs to the EDCs activities and provide resources that will meet teacher needs.

2. EDCs have to be strategically established to support teachers by providing a pedagogical venue to provide teachers with SCK, PCK and practical activities that lead to teacher active participation. This implies that the EDCs should be resourced to cater for teacher practical, cognitive and technological needs such that teachers can access it at any hour of the day. On a broader scale, it would seem that EDCs have the potential to provide more than merely a venue for teachers in the province. With the establishment of the Mathematics, Science and Technology (MST) Academy<sup>7</sup> in the province, the EDCs are able to serve as district hubs where teachers could be centrally reached. Programmes designed by the provincial team at the Science and Technology Academy could then be effectively conducted and monitored in the existing district EDCs through the EDC staff.
  
3. EDCs cannot develop quality activities and services alone. EDCs also need support from the Department to invest on EDCs to effect changes by providing;
  - *financial support*: the EDCs remain the property of the Department of Basic Education in the South Africa context and, as such a budget for running programmes must be allocated.
  - *well-trained staff*: for the centre to function, it must have a team to plan collectively for the centre's programmes and to ensure that the programmes meet the needs of teachers.
  - *appropriate and adequate resources*: these provide a range of educational resources to support teaching and learning. The EDC should serve as an information centre for all educational references and material development.

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<sup>7</sup> An academy established to provide an in-service learning platform for Mathematics, Science and Technology teachers to enhance their teaching skills. It is linked to satellite hubs through which it provides direct support to school.

## 5.7 CONCLUSION

This study brings forth the importance of evaluation as an integral part of education and strengthens the culture of evaluation to gain a better understanding and ensure quality in education programmes. Evaluation must be included in the planning process as a way of utilizing the evaluative findings to improve the planned activities and services in an organisation. Education is concerned with the inculcation of a range of skills including the ability to think creative, work in group and manage risks and handle uncertainty. As such, effects of programmes to inculcate such features may not become apparent until completion of participation in a programme, and therefore it requires an ongoing evaluation.

Throughout this study, professional development was seen as related to the acquisition of professional expertise (SCK) and teaching techniques (PCK) associated with the classroom practices (The Resource Document Teacher Development Summit, 2009). Understanding of the concept of professional development ensures the appropriate identification of activities and services. The best professional development is ongoing, experiential, collaborative and derived from teachers' needs. One critical aspect in professional development is the willingness of teachers to be developed. Teachers must understand the meaning of professional development and be a mover in the development of activities and services.

One avenue for future research should be to explore in more detail the characteristics and conditions that give the EDCs the capacity to provide quality professional development activities and services such as the possibility of improving collaboration for teachers to reduce teacher isolation and save on teacher time for travelling by introducing technological tools like Internet and interactive whiteboard (SMART board). Seeing that teachers in rural areas are not only limited by distance to the EDC, they are also under-resourced and have no laboratories. Clustering schools to be able to use this interactive programme would reduce the stress of cost and time. Notwithstanding the fact that the preparation would be challenging the end product would be the best investment possible for the learners, teachers and the Education Department. Those who plan and facilitate professional development activities and services need to support teachers as they develop the theoretical understandings and material that will enable teachers to inquiry approach to their everyday teaching practice.

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## ANNEXURES

<b>APPENDIX A</b> Clearance Certificate	Paper copy
<b>APPENDIX B</b> Application for permission to conduct the study	CD only
<b>APPENDIX C</b> Consent Letters	CD only
<b>APPENDIX D</b> Interview transcripts	CD only
<b>APPENDIX E</b> Teacher Questionnaire	CD only
<b>APPENDIX F</b> Field notes	CD only
<b>APPENDIX G</b> EDC Document 1	CD only

## APPENDIX A



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA  
Faculty of Education

### RESEARCH ETHICS COMMITTEE

**CLEARANCE CERTIFICATE**

**CLEARANCE NUMBER :**

SM 11/07/02

**DEGREE AND PROJECT**

M.Ed

Evaluation of activities and services of the Mpumalanga Education Development Centre

**INVESTIGATOR(S)**

Nessie Dorah Chambale

**DEPARTMENT**

Science, Mathematics and Technology Education

**DATE CONSIDERED**

21 August 2013

**DECISION OF THE COMMITTEE**

APPROVED

Please note:

*For Masters applications, ethical clearance is valid for 2 years*

*For PhD applications, ethical clearance is valid for 3 years.*

**CHAIRPERSON OF ETHICS  
COMMITTEE**

Prof Liesel Ebersöhn

**DATE**

21 August 2013

**CC**

Jeannie Beukes  
Liesel Ebersöhn  
Dr V Scheman

This ethical clearance certificate is issued subject to the following conditions:

1. A signed personal declaration of responsibility
2. If the research question changes significantly so as to alter the nature of the study, a new application for ethical clearance must be submitted
3. It remains the students' responsibility to ensure that all the necessary forms for informed consent are kept for future queries.

Please quote the clearance number in all enquiries.