DOCTORAL (PHD) DISSERTATION

Moses Gunda Njenga

Continuing Professional Development Practices of TVET Teachers in Kenya

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EÖTVÖS LORÁND UNIVERSITY
FACULTY OF EDUCATION AND PSYCHOLOGY

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Abstract

This study investigated the Continuing Professional Development (CPD) practices of Technical and Vocational Education and Training (TVET) teachers in Kenya. The study was guided by a theoretical framework based on the Adult Learning Framework and the Rational Choice Theory. From a Critical Realist perspective, the study adopted a concurrent mixed methods approach involving a questionnaire survey and semi-structured interviews targeting TVET teachers in six Technical and Vocational Colleges in Kenya's Nairobi Metropolitan Area.

TVET teachers in Kenya were found to have multiple aims for their CPD and to be strategic and selective in their choice of content and learning methods. Depending on what the context makes available, and as self-directed learners and rational actors, teachers selectively choose content and learning methods that enable them to attain their different learning goals. From an analysis of the profiles of the participating TVET teachers and their CPD practices, four TVET teacher CPD orientations were identified. These are teacher CPD for improved task-performance competence, teacher CPD for improved status and authority, teacher CPD for rejuvenation, and teacher CPD as a requirement. Underlying their CPD practices was their view of TVET teaching as a complex role that centres on instructing, presenting information and supporting students' character development with mastery of content and good delivery skills identified as essential competencies for the role.

The aims teachers have for their CPD as well as their choices for content, learning methods and timing for CPD were found to depend on the personal characteristics of teachers and contextual factors. Personal characteristics identified include if a teacher has received initial teacher education or not, non-teaching responsibility held, career stage, ability to pay the expenses associated with teacher CPD, and the perceived helpfulness of various learning methods. Contextual factors identified include the availability of learning methods, institutional practices and the conceptions underlying institutional practices, and student evaluation practices.

The study also found that TVET teacher CPD in Kenya experiences multiple constraints which limit the availability and effectiveness of TVET teacher CPD in Kenya. The constraints include the lack of an explicit policy framework to guide TVET teacher CPD, lack of financing and other resources including time for CPD, and institutional policies that recognize a limited set of learning methods. Teachers therefore use a limited set of learning methods, and in the absence of a clear policy to guide TVET teacher CPD, there lacks mechanisms for reporting and tracking participation in teacher CPD as well as systems to evaluate and improve the quality of TVET teacher CPD. The constraints were attributed to limitations in different forms of capital that characterize developing countries.

To address the challenges and constraints to effective TVET teacher CPD in Kenya, it was recommended that a unified policy on TVET teacher CPD be developed and implemented, and the policy be supported by a review of related policies. Accordingly, various recommendations to improve TVET teacher CPD in Kenya were identified and formulated as policy proposals.

Keywords: Continuing Professional Development, Formal and informal learning, Policy, TVET, Teachers, Kenya

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Dedication

I dedicate this work to my teachers:

- My Family, Parents and Siblings: your counsel has been invaluable and your questions about why I do what I do have always reminded me of the bigger aims;
- My School and University Teachers: you taught, counselled and helped me grow; your counsel was like a torch shining through mists of confusion.
- My Friends: I learnt and explored the world with you. Without you, life would be tasteless and I would have given up a long time ago.

You have all been my teachers; helping me to see what I needed to see and helping me to comprehend it. I hope that my achievement will inspire you to a life of continued self-renewal through continuous learning.

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List of abbreviations

CPD: Continuing Professional Development

ITE: Initial Teacher Education

ECS: Early Career Stage

LCS: Late Career Stage

LIA: Lecturer Industrial Attachment

KTTC: Kenya Technical Teachers College

Ksh: Kenya Shilling

KSTVET: Kenya School of Technical and Vocational Education and Training

MCS: Middle Career Stage

TALIS: Teaching and Learning International Survey

TSC: Teachers Service Commission

TTI: Technical Training Institute

TVC: Technical and Vocational College

TVET: Technical, Vocational Education and Training

VTC: Vocational Training Centre

Chapter 1 Introduction

This introductory chapter presents the background and rationale of the study. It does so by stating the importance of the Continuing Professional Development (CPD) of vocational teachers and identifying an existing research gap in the CPD practices of vocational teachers in developing countries. It then continues to state the objectives of the study as well as the research questions guiding the study. The chapter concludes by highlighting the significance of the study and an outline of the rest of the dissertation.

1.1 Background and rationale of the study

UNESCO uses the term Technical and Vocational Education and Training (TVET) to refer to vocational education, and has defined TVET as a broad set of educational processes which, apart from supporting the development of general knowledge, skills and attitudes, enable the acquisition and development of technical competencies and understanding of technologies and sciences related to occupations in various sectors of the economy and social life (UNESCO, 2001). From my review of literature on the concept of TVET (Njenga, 2020a), I concluded that the essence of TVET is the learning and mastering of useful techniques that have practical and occupational or vocational focus. This focus on the learning and mastering of practical and useful techniques of doing means that TVET enables participation in economic activities, and therefore leads to individual well-being and economic growth (Hoeckel, 2008; McGrath, 2011; Tripney & Hombrados, 2013). In addition, TVET has strong emancipative power and therefore enables social inclusion. Accordingly, TVET has become a focal point in both development policy and education policy (Billet, 2011; Rawkins, 2018; Tur Porres et al., 2014).

These positive outcomes of TVET are however not absolute, but are dependent on the quality and relevance of TVET. Indeed, low quality education can have strong negative social outcomes wherein it creates poverty traps (Van Der Berg et al., 2011) while leaving students vulnerable to exploitation and ill-treatment (Haßler et al., 2020). Haßler et al. add that, a pedagogical approach to TVET that is both critical and competence oriented can support learners to not only develop the desired practical competencies, but to also develop critical understandings and to take on responsibility within the society. However, given the central role that teachers play in any organised educational activity, a pedagogical approach that is critical and competence oriented

requires that vocational teachers be critical and reflective practitioners in addition to being competent in their trades and teaching. The quality, relevance and indeed effectiveness of TVET thus depends on the competencies of TVET teachers and the pedagogical approaches that TVET teachers are able to adopt (Cedefop, 2016; Gamble, 2013; Rawkins, 2018; Wheelahan, 2010).

The competence and effectiveness of TVET teachers has however been shown to depend on their professional knowledge, skills and values and that these qualities can be improved when teachers participate in Continuing Professional Development (Barrera-Pedemonte, 2016; Cedefop, 2016; Desimone, 2009; Murchan et al., 2009; Stéger, 2014; Zhou et al., 2022). In fact, supporting teachers to improve their professional competencies has been shown to produce the highest increases in learning outcomes compared to other investments aimed at improving learning outcomes (Darling-Hammond, 2000, 2017; Murchan et al., 2009).

Teacher competencies do not just influence in-class learning but the functioning of the entire education system as well. As internal agents of the education system, teachers possess significant power to alter and distort externally mandated policies (Goodson, 2001; Waks, 2007). Teachers are thus critical in implementation of educational policies, whereby they act as mediators and gatekeepers in the translation of policy to practice (Brain et al., 2006; DeJaeghere et al., 2006; Viennet & Pont, 2017). Their competencies are therefore vital for the success of any educational intervention or policy. Developing their competencies is thus an important requirement for long-term educational improvements. Professional development of teachers is thus recognized as a critical mediator of the effectiveness of educational policy and the successful implementation of educational reforms (Desimone, 2009; Murchan et al., 2009). The foregoing demonstrates the importance of supporting TVET teachers participate in Continuing Professional Development (CPD) and ensuring that TVET teachers are able to benefit from their professional development activities.

Statement of the problem

Despite its importance, effective TVET teacher CPD remains unavailable to many teachers across the world (Axmann et al., 2015; Rawkins, 2018) and especially in Sub-Saharan Africa (Grijpstra & Papier, 2015). Moreover, due to limited research, it is not

always clear what content TVET teachers learn in their CPD, the learning methods they use, or how effective their CPD practices are in developing desired TVET teacher competencies or the impact of their CPD activities on teaching practices (Stanley, 2021). This lack of insight into the content, methods, effectiveness and impact of TVET teacher CPD is more common in developing country contexts where research on TVET remains limited. The lack of data and research insights hinders the development of policies and programmes to support the continuing professional development of TVET teachers. Haßler et al. (2020) thus note that the CPD of TVET teachers in Sub-Saharan Africa should be further researched and developed in evidence-based ways.

Kenya is one such country in Sub-Saharan Africa where a key concern over the years has been that TVET teachers in the country have been unable to improve their professional competencies (Akala & Changilwa, 2018; Sifuna, 2020). Moreover, there exists no formal policy on the Continuing Professional Development of both general and vocational teachers. In the absence policies and professional guidelines, teacher CPD in Kenya remains under resourced and poorly targeted (Lowe & Prout, 2018).

Within this context and given the limited research into the CPD practices of TVET teachers, it remains unclear how TVET teachers in Kenya improve their professional competencies, the challenges they face, and the policy options available to improve TVET teacher CPD in Kenya. It is also unclear how different factors, learning needs and teacher motives influence TVET teacher CPD in the country. In addition, the meanings TVET teachers in Kenya hold about teaching and teacher CPD and how the held meanings influence their CPD practices have not been investigated. To address the existing research gap into the CPD practices of teachers in Kenya and to potentially identify appropriate measures to support TVET teacher CPD in Kenya, this study therefore sought to investigate the CPD practices of TVET teachers in Kenya.

1.2 Objectives and research questions

Accordingly, the following objectives and research questions guided the study.
Objective 1: Identify and evaluate the Continuing Professional Development (CPD) practices of TVET teachers in Kenya.

Attaining these objectives called for:

- Identifying the different formal and in-formal learning methods TVET teachers use as part of their CPD
- Evaluating how effective past CPD activities were and their perceived impact

Objective 2: Investigate the factors that influence the CPD practices of TVET teachers in Kenya.

Attaining this objective called for:

- Investigating the conceptions and held meanings about teaching that guide TVET teacher CPD practices
- Investigating the learning needs that TVET teachers wish to fulfil when they participate in their CPD
- Identifying the motives that influence TVET teacher CPD practices in Kenya
- Identifying the costs and challenges that teachers face when they participate in CPD
- Investigating how personal and institutional factors influence TVET teacher CPD practices

Objective 3: Identify and suggest policies to improve and guide the Continuing Professional Development of TVET Teachers in Kenya.

Attaining this objective called for using the study findings and diverse literature on teacher CPD to identify and propose policy recommendations to improve the CPD practices of TVET teachers in Kenya.

Research questions

To ensure the attainment of the study objectives and guide the study, the following research questions were formulated:

Research question 1: What meanings are held by TVET teachers in Kenya about teaching and teacher learning? How do the held meanings influence CPD practices?

Research question 2: What are the Continuing Professional Development practices of TVET teachers in Kenya?

Research question 3: How do personal and contextual factors influence TVET teacher CPD practices in Kenya?

Research question 4: How effective are TVET teacher CPD practices in Kenya?

Research question 5: What motives, benefits, costs, and challenges are associated with TVET teacher CPD practices in Kenya?

Research question 6: What policy changes can lead to effective TVET teacher CPD in Kenya?

1.3 Preliminary assumptions

The study adopted a mixed methods approach, and did not aim at testing specific initial hypotheses. Still, it was possible to identify and articulate several preliminary assumptions which guided the study. One normative assumption was that TVET teacher CPD is valuable in its own light and it is therefore worthwhile to study it and seek measures to improve it.

Other theoretical and methodological assumptions guided the study. One theoretical assumption was that conceptions and held meanings influence human practices, and in particular, the CPD practices of TVET teachers. Accordingly, the study sought to identify how TVET teachers in Kenya conceptualize teaching and Continuing Professional Development, as well as how those conceptions influence their CPD practices. A methodological assumption was that teachers can identify those conceptions and held meanings, can do so truthfully, and can express the conceptions clearly and without bias. Similar assumptions were made with respect to motives for TVET teacher CPD. Related to these assumptions were that teachers could accurately recall their past CPD activities and that the data collection instruments could validly and reliably collect data related to the CPD practices of TVET teachers in Kenya.

Another theoretical assumption was that TVET teacher CPD is influenced by personal and contextual factors. Accordingly, the study aimed at identifying these factors and their effects. A methodological assumption stemming from this assumption was that it is possible to identify these factors, and to assess their effects on the CPD practices teachers adopt. Accordingly, the study investigated the effects of personal factors such as gender, age, career stage, and prior educational experiences on the CPD practices teachers adopt. Similarly, the effects of contextual factors such as student assessment practices, professional guidelines, and availability of learning opportunities were investigated.

Underlying the analysis of the effects of these factors was that the assumption that these factors either encourage or hinder participation in CPD. Analysis of the collected data thus focused on increases or decreases in participation rates due to variations in the factors. Another assumption was that it is not just the presence of a particular factor that influences practices, but that absences also influence practices and their outcomes. Factors were thus taken to vary not just by type and magnitude but to also vary by presence or absence.

This ontological assumption thus led to the examination and interpretation of observed CPD practices in terms of both what exists and what lacks, as well as the identification of "systemic inputs" that can improve practices and their outcomes. In particular, it was assumed that particular institutional practices influence TVET teacher CPD practices. Similarly, it was assumed that the absence of TVET teacher CPD policies influence the CPD practices TVET teachers in Kenya adopt as well as the effectiveness and outcomes of the practices. Moreover, it was assumed that it is possible to identify policy proposals to guide and improve TVET teacher CPD in Kenya. Accordingly, the study sought to identify policy proposals that can improve and ensure effective TVET teacher CPD practices in Kenya.

1.4 Significance of the study

By answering the above questions, the study sought to develop a clearer understanding of the Continuing Professional Development practices of TVET teachers, not just in Kenya but elsewhere, especially in developing country contexts.

From an educational research point of view, the study is significant in that it fills a gap in the body of knowledge about TVET teachers: their beliefs about teaching and CPD, their CPD needs and motives, and the formal and informal learning practices they use. The study also opens up opportunities for future research based the theoretical framework developed to guide the study.

A central aim of the study is to identify and propose policies to guide and sustain effective TVET teacher CPD in Kenya. Thus, from a policy point of view, the study provides policy makers with multiple insights and suggestions on how to improve TVET teacher CPD. Thus, the study can inform policy makers on how to address the constraints and challenges TVET teachers face in improving their professional

competencies. The study also identifies gaps in pre-service and in-service TVET teacher education and recommends various strategies to address those gaps.

1.5 Outline of the dissertation

In addition to highlighting the significance of the study, this first chapter of the dissertation has discussed the rationale and background of the study and the ensuing objectives and research questions. The next chapter provides an overview of the literature that guided the study, and then discusses the characteristics of teacher CPD and the factors that influence how teachers participate in CPD. Based on this discussion, the chapter presents the theoretical framework that guided the study. The third and fourth chapters present the dual context of the study. The third chapter discusses TVET as unique context for teacher CPD, wherein the unique features of TVET influence the aims, content and learning methods TVET teachers adopt in their CPD. The second context relates to the physical location of the study, and how its historical, cultural and economic conditions influence TVET teacher CPD. The fourth chapter thus presents an overview of education and TVET in Kenya and the status of TVET and TVET teacher CPD in Kenya.

The fifth chapter provides a detailed discussion of the ontology and methodology that guided the study. From this discussion, the chapter concludes with a justification of using a mixed methods approach. Chapter six continues by elaborating on the methods used in the study: a concurrent use of a questionnaire survey and semi-structured interviews. The chapter then discusses the data collection instruments and their development, how participants were selected, and data collected. The chapter concludes with a brief statement of the research ethics that arose and how they were handled. The seventh chapter then presents the main findings of the study. Starting with a description of the participants, the chapter then presents findings relating to each research question. The eight chapter discusses the study findings in relation to the theoretical framework and wider literature on teacher CPD. The ninth chapter picks up from here. The chapter starts by exploring the concept of policy before discussing the policy recommendations that were identified based on the study findings. The chapter then closes the dissertation with a highlight of outcomes of the study and its possible limitations.

Chapter 2 Teacher Continuing Professional Development

This chapter presents the literature that guided the study. The chapter starts by presenting an overview of the methodology and questions that guided the review. On the basis of the questions, a research-based definition of teacher CPD is presented, followed by a discussion of research findings on the characteristics of teacher CPD, the factors that influence teacher CPD, and a broad overview of past analytical frameworks on teacher CPD. This discussion sets the stage for the presentation of the theoretical framework that guided the study and the research implications that ensue from the theoretical framework. The chapter then concludes with a short summary of the reviewed literature and a highlight of the implications of the literature for the rest of the study.

2.1 Methodology of the literature review

To guide the study and ground it in previous research, the study started with a narrative review of literature. Narrative reviews of literature, sometimes referred to as traditional reviews are often contrasted to systematic review of literature. Unlike systematic reviews which describe and aggregate past findings, narrative reviews seek to integrate and interpret past research findings and develop a new conceptual understanding (Bryman, 2012; Gessler & Siemer, 2020; Hobson et al., 2009). Accordingly, in line with the aims of narrative reviews of literature, the present review did not seek to systematically review and aggregate past research findings on teacher CPD. Instead, the broad aim was to review both theoretical and empirical studies on teacher CPD, integrate their findings, and develop a reconceptualization of teacher CPD that was relevant to the study in the form of a theoretical framework which could guide the rest of the study.

The narrative review of literature followed the recommendations given by Bryman (2012) on conducting narrative reviews of literature. To ensure that a narrative review of literature is focused, relevant to the aims of the study and exhaustive, Bryman, and earlier Slavin (1986), made several recommendations, which include: Posing a set of guiding questions that are in line with the objectives of the study; Adopting a flexible inclusion criteria where studies are reviewed based on their relevance to the objectives of the study rather than on the basis of a strict set of exclusion and inclusion conditions, and; Iterative addition of new studies based on the findings from the reviewed studies.

According to Bryman (2012) such an approach ensures that the review remains open to the discovery of new themes that could enrich the study.

These recommendations were adhered to during the entire review process. After posing the guiding questions, studies were searched for on major electronic databases using combinations of keywords from the guiding questions. The studies were then reviewed and summaries of key points made. This was supplemented by a process of iterative addition of older studies mentioned in the reviewed studies. Thus, and in line with the guiding questions, the studies reported are those that present a convincing picture of the main aspects of teacher CPD and the factors that influence how teachers participate in CPD irrespective of the methodology adopted by the reviewed studies. Other studies provide thematic discussion of the issues that impinge on teacher CPD practices, and were similarly included based on the relevance of the themes they discussed to the study. Hobson et al. (2009) followed a similar approach in their review of literature on teacher mentoring.

Some of the findings presented are drawn from research studies focusing on both general education teachers and higher education teachers. In their research on teaching in higher education, Entwistle et al. (2000) and Kane et al. (2002) identified that a significant number of studies on teaching in higher education referred to studies focusing on primary and secondary education. However, they contended that despite their distinctive characteristics, the two levels of education share common characteristics that enable a borrowing of findings about teaching. This work is based on a similar argument. Moreover, significantly more research work on teacher CPD has focused on general education teachers in comparison to the work done on teacher CPD in the TVET sector. However, despite the uniqueness of teaching in the TVET sector, teaching in the TVET sector shares many characteristics with teaching in both general education and higher education to enable a borrowing of findings.

Guiding questions

Based on the objectives of the study, the review of literature focused on the Continuing Professional Development (CPD) practices of teachers with a special focus on TVET teachers. Since the review aimed at developing a broad understanding of teacher CPD centred on the key aspects that characterize teacher CPD and the factors that influence

how teachers participate in CPD, the questions posed to guider the review of literature were:

a. What aspects characterize teacher CPD and TVET teacher CPD in particular?
b. What factors influence how teachers participate in teacher CPD?
c. How do the factors interact to influence teacher CPD practices and TVET teacher CPD practices in particular?
d. What policies can stimulate and guide effective TVET teacher CPD in Kenya?

The review led to a broad reconceptualization of teacher CPD, and a consideration of theoretical propositions that could explain teacher CPD practices. Consequently, a theoretical framework was developed to explain teacher CPD practices based on the general characteristics of teachers, key attributes of teacher CPD, and the factors that influence how teachers participate in CPD. These findings are described in the rest of the chapter. Chapter three highlights findings that are more specific to TVET teachers and TVET teacher CPD.

2.2 Definition and characteristics of Teacher CPD

Friedman & Phillips (2004) note that professional development entails the acquisition, maintenance, improvement, and broadening of the knowledge, skills, and personal qualities that enable effective execution of professional and technical duties. They define Continuing Professional Development (CPD) as all learning that is intended to improve professional competence and note that such learning may be formal, non-formal or informal. Referring specifically to teachers, Desimone (2009) and Richter et al. (2011) describe teachers' CPD as all the ongoing formal and informal learning activities that deepen and extend teachers' professional competencies. A primary aim of teacher CPD is thus to improve and extend the professional competencies teachers acquired during their pre-service training (OECD, 2013). Teachers' CPD attains this aim by supporting teachers to acquire new knowledge, skills and attitudes that teachers need to be effective. Increased teacher effectiveness is then reflected in improved student learning outcomes (Desimone, 2009; Fraser et al., 2007; Hendriks et al., 2010; Muijs & Reynolds, 2017; Postholm, 2012; Timperley et al., 2007).

Note on terms

Various other terms are used to refer to those processes that support the professional development of teachers. These include, teacher learning, teacher professional learning, teacher development, teacher professional development, teacher education, in-service teacher training etc (Fraser et al., 2007). While different scholars define these terms differently, the terms generally imply educative processes that teachers engage in with the aim of developing professionally, either before or after teachers have started working as teachers. Scholars may highlight specific attributes of these educative processes and choose the term that best describes those attributes.

Generally, Continuing Professional Development of teachers (herein teacher CPD) refers to professional development that takes when a teacher is already working as a teacher in addition to their initial training as a teacher. The term is preferred since it suggests a wide range of ongoing learning activities that teachers engage in as they seek to develop their professional competencies. Since the focus of the study was on individuals already workings as teachers, the study therefore adopted this term. The term TVET teacher CPD will be used to refer to Continuing Professional Development of TVET teachers.

2.2.1 Aims of teacher CPD

One approach to better understand teacher CPD is to consider key aspects that characterize teacher CPD. A close reading of literature on teacher CPD shows that a central aspect of teacher CPD relates to the aims and roles of teacher CPD. For example, from the definitions above, it is clear that a principal aim of teacher CPD is to develop teachers' professional competencies and therefore their effectiveness as teachers. Indeed this aim is used as a basis to identify criteria for effective teacher CPD (Desimone, 2009; Fischer et al., 2018; OECD, 2013, 2019; Olofson & Garnett, 2018; Postholm, 2012).

Other aims and roles of teacher CPD identified by researchers include supporting teachers to remain adaptable, expand career options, and prepare for future work (Collin et al., 2012; Fraser et al., 2007; Muijs & Reynolds, 2017; Richter et al., 2019). Teacher CPD also serves as a solution to teacher boredom and alienation (Guskey, 2002a; Richter et al., 2019). Teacher CPD is also an avenue for the greater professionalization of the teaching profession (Hildebrandt & Eom, 2011; Misra, 2011; Rawkins, 2018).

According to Friedman & Phillips (2004), CPD often serves to show the public that professionals take their work seriously and are up to date with technical and scientific developments. In this regard, teacher CPD often plays a regulatory role wherein it serves as a means for identifying competent and adaptable employees, as a condition for promotion, and as a tool for professional associations to confirm conformity with standards. Participating in CPD can therefore often be an act of compliance (Dia et al., 2005; Jarvis, 2004; Pool et al., 2016; Rzejak et al., 2014).

Teacher CPD may thus be characterized by diverse aims which reflect the motives or reasons individual teachers have for engaging in professional development. Alternatively, teachers may participate in CPD due to external reasons such as meeting professional requirements or government directives.

2.2.2 Content of teacher CPD

Another characteristic of teacher CPD that emerged from the reviewed literature relates to the knowledge and skills teachers learn in order to develop their competencies. Researchers have thus focused on this aspect of teacher CPD and have identified various categories of teacher knowledge. Categories of teacher knowledge include subject or content knowledge, pedagogical knowledge, craft knowledge, and personal-practical knowledge (Carlsen, 1999; Fenstermacher, 1994; Kane et al., 2002; Morine-Dershimer & Kent, 2006).

According to Fenstermacher (1994), one of the most exhaustive and widely used categorisation of teachers' professional knowledge was done by Lee Shulman. Shulman (1986) argued that teacher knowledge is the foundation for the skills and attitudes effective teachers have. From his analysis, he identified three domains or categories of teacher knowledge. The first is Subject Content Knowledge (SCK), which refers to deep knowledge of subject matter that a teacher is expected to teach. Teachers are thus expected to not only know the facts that they should teach, but the justifications and assumptions that underlie those facts, the methods used to arrive to those facts, and how those facts are organised into a collective that forms the subject.

The second is Pedagogical Content Knowledge (PCK). Pedagogical Content Knowledge can be interpreted as the knowledge and skills of teaching a specific subject. PCK enables a teacher to translate content knowledge into content for instruction in

ways that students can comprehend. The teacher is thus expected to be able to plan out the content for effective instruction, select and adopt appropriate teaching methods, and evaluate learning. Additionally, the teacher should be able to identify students' misconceptions and know how to help students avoid them.

The third and final category is General Pedagogical Knowledge (GPK). General Pedagogical Knowledge refers to the general teacher knowledge. In this domain, Shulman specified knowledge about learners and their differences and therefore the ability to match content and instruction to learner characteristics. Other specific sub-domains of knowledge in this category are knowledge of generic methods of classroom organization and management, knowledge of the history and philosophy of education, school finance and administration as well as student guidance and counselling among others (Diaz-Buxo, 2007; Fenstermacher, 1994; Guerriero & Deligiannidi, 2017; Shulman, 1986). Subsequent research on teacher learning has affirmed this categorization (Barrera-Pedemonte, 2016; Desimone, 2009; Neumann et al., 2019; Postholm, 2012).

Teacher CPD may thus be characterized by the content teachers learn during their CPD. Based on the discussion on the aims of teacher CPD above, and because learning relates to meeting underlying learning needs or developing specific competencies, it is clear that the content teachers learn may vary depending on the learning needs teachers have and the competencies teachers seek to develop. In addition, the content learnt may reflect the content and competencies teachers are required to learn and develop.

2.2.3 Learning methods in teacher CPD

As a process of learning, another aspect of teacher CPD relates to the learning methods teachers use in their CPD. Researchers have thus sought to identify the different learning methods teacher use in their CPD and to classify these methods into a coherent framework. One such categorization relates to how formal or informal the learning methods are.

Foley (2000) elaborated on this categorization and distinguished between formal, non-formal, informal and incidental learning. Formal and non-formal learning are characterized by the presence of organized curricular, systematic instruction and facilitation by experts while informal and incidental learning activities lack formalized

instruction, curricular or structure. Distinguishing between formal and non-formal learning, Foley notes that while formal learning features well-defined and controlled curricula leading to some form of recognized qualification, non-formal learning may be one-off or sporadic and often does not lead to formal qualifications. With respect to informal and incidental learning, the distinction rests on the conscious awareness of the learner about their learning. Thus, in informal learning, the learner is aware and conscious of their need to learn, and therefore consciously engages in learning and reflects on the learning process and its outcomes. Informal learning practices are therefore characterized by a high degree of self-direction in the absence of a formal curriculum and facilitators. Incidental learning lacks such conscious and intentional engagement with learning possibilities.

Formal teacher CPD activities are therefore characterized by a predefined structure, systemic instruction and the use of experts and facilitators; common examples include academic courses, seminars, conferences and workshops. Informal teacher CPD activities on the other hand are characterized by the lack of a predefined structure and include self-directed learning, peer and collaborative learning, reflection, mentoring others, and developing of learning materials (Desimone, 2009; Kennedy, 2014; Postholm, 2012; Richter et al., 2011; Sancar et al., 2021). These learning activities may take place in the school or outside the school (Andersson & Köpsén, 2015; Broad, 2016; Desimone, 2009; Lecat et al., 2019; OECD, 2013; Richter et al., 2011).

Accordingly, teacher CPD may be characterized by the use of formal and informal learning methods. In line with the discussion above, teachers may use different learning methods to meet different learning needs or attain different goals.

2.2.4 Summary on characteristics of teacher CPD

From the reviewed literature, it can be concluded that teacher CPD practices are characterized by multiple aims, diverse content, and a wide-range of learning methods. Teacher CPD could be aimed at improving professional competencies, at career progress, or dealing with challenges such as boredom and burnout. Teacher CPD may also be aimed at meeting government directives and standards set by professional bodies. These aims may be pursued by learning different content using a variety of learning methods. Thus, depending on the aims teachers have, they may seek to learn and develop their Subject Content Knowledge, Pedagogical Content Knowledge, and

General Pedagogical Knowledge. Similarly, depending on their aims and the content they seek to learn and competencies they seek to develop, teachers may use formal and informal learning methods.

2.3 Factors Influencing how teachers participate in teacher CPD

Apart from considering the aims, content and learning methods that characterize teacher CPD practices, a different approach to understanding teacher CPD focuses on the factors that influence teacher CPD and how the factors influence teacher CPD practices. These factors, classified as personal factors and contextual factors, are discussed below.

2.3.1 Personal and contextual factors

One such set of factors that emerged from the reviewed literature relates to the personal characteristics of teachers. For example, Barrera-Pedemonte (2016) reviewed literature on teacher CPD and found that across different countries, access to and participation in different forms of professional development varies with teachers' characteristics such as age, gender, and completion of pre-service training. Other studies have shown variations in participation rates due to age, educational attainment, occupational area, and prior CPD experiences (Day & Gu, 2007; Kelchtermans, 2004). Other personal factors identified are personal needs for income, job security and prestige, personal beliefs, and past CPD experiences (Appova & Arbaugh, 2018; de Vries et al., 2013; Powell et al., 2003). Motivation has also been shown to be a personal factor that influences teacher CPD (Appova & Arbaugh, 2018; Kowalczuk-Walędziak et al., 2017; Lecat et al., 2019). Hildebrandt & Eom (2011) also examined the motives teachers have for participating in CPD and identified four key motivators: improved teaching, financial gain, opportunities for collaboration, and validation. Moreover, these motives vary with age.

The other set of factors that emerged from the literature relates to the institutional and contextual conditions within which teachers work and practice their CPD. Researchers have identified context-based factors such as educational policies, policies guiding the professional development of teachers, and type of school and its location (e.g., private vs. public, urban vs. rural) (Andersson & Köpsén, 2015; Boylan et al., 2018; Bükki, 2022). Other context based factors include availability of opportunities to participate in CPD, availability of resources and incentives for participation (Appova & Arbaugh, 2018; OECD, 2014; Sancar et al., 2021) and the nature of the student body (Austin et

al., 2015). Another factor influencing teachers' participation in CPD are the barriers and challenges associated with teacher CPD (OECD, 2019).

2.3.2 Effects of personal and contextual factors on teacher CPD practices

Other research studies provide evidence on how the factors identified above influence teacher CPD practices. For example, in a study by David & Bwisa (2013) focusing on secondary school teachers in Kenya, teachers' involvement in CPD was found to decrease with age. Further, male teachers and teachers who had college rather than university level education were more likely to participate in professional development to secure their jobs. In agreement with these findings, Masuda et al. (2013) found that age and career stage strongly influence the uptake of CPD. In their study, different career stages (i.e., pre-service teachers, beginning teachers, midcareer teachers, late career teachers) were found to be associated with different learning needs and different learning practices due to differing perceptions of learning needs and value obtained from learning.

Other studies have found associations between the career stage of teachers and their choice of content and learning method. Richter et al. (2011) found that German secondary school teachers used formal and informal learning practices differently depending on their career stages. For example, middle career stage teachers used formal learning methods more frequently compared to other groups of teachers. Moreover, young teachers were found to rely more on observation and informal discussions to improve practice while more experienced teachers were found to prefer more formal approaches (Richter et al., 2011). In a study focusing on primary school teachers in Israel, Avidov-Ungar & Herscu (2019) found that entry level teachers desire to learn content beyond their current focus in the classroom while expert teachers were opposed to compulsory trainings. Mid-career teachers who often held additional school responsibilities were more concerned about the availability of time.

From their study, Richter et al. (2019) concluded that motivation, i.e., the reasons teachers give for learning, predicts participation in teacher CPD. In another study, Pool et al., (2016) identified and related motives for CPD to specific learning activities that nurses frequently engage in. They found that to increase competence, nurses in the study frequently engaged in self-directed learning while for purposes of career development, nurses frequently chose post-graduate education. The findings cited above

agree with other studies focusing on adult learning practices. In a survey of adult learning trends in Europe, Cedefop found that participation in job-related training declines with age. However, adults with higher qualifications and working as managers or technicians were more likely to participate in job-related training than those with lower educational qualifications or holding low skill jobs. Gender was not found to significantly influence participation (Cedefop, 2015a, 2015b).

Other studies have focused on the influence of institutional and contextual factors on teacher CPD practices. For example, Desimone, Smith, & Phillips (2007) looked at the nature of the policy environment and its influence on teacher CPD. Teacher CPD policies deemed legitimate and that offered relevant rewards and sanctions had a positive effect on teachers' participation in CPD. They also found that for policies to be effective, the policies must be consistent and stable. In a consequent study, state and school policies were found to have strong effects especially when aligned with assessment practices. However, school level policies were found to have a stronger effect than state polices (Desimone et al., 2007; Phillips et al., 2011). By specifying the required or acceptable forms of teacher CPD, teacher CPD policies have also been linked to the CPD opportunities availed to or used by teachers (Bolam, 2000; Boylan et al., 2018; Hardy & Lingard, 2008; Whitehouse, 2011). Policies thus influence teachers' CPD participation by structuring incentives, time frames and outcomes of CPD.

As a feature of the institutional and organisational context, researchers have also looked at the different barriers and challenges to teacher CPD. In the Teaching and Learning Survey of 2018, participating teachers reported a wide range of barriers to participating in teacher CPD. These include CPD schedules that conflict with teachers' work schedule, lack of appropriate incentives, CPD being too expensive, and the lack of relevant professional development opportunities. Other barriers identified include lack of time due to family commitments, lack of employer support and teachers not having prerequisites (OECD, 2019). Other challenges that have been identified include lack of necessary ICT facilities, lack of pre-requisite training, and feeling too old to participate (Cedefop, 2015a, 2015b; David & Bwisa, 2013).

Focusing on adults, Cedefop (2015a) found that the effects of barriers and challenges to professional development vary with the social economic status and prior educational qualifications of adults. For example, adults with low educational qualifications are

more likely to lack pre-requisite training than their counterparts with better educational backgrounds.

2.3.3 Summary on factors influencing teacher CPD practices

The findings reported above show that personal and contextual factors influence participation in teacher CPD. Personal factors include age, gender, and prior education level attained. Others include teacher motivation for CPD, past CPD experiences, career stage, and teaching area. Contextual factors include the type of school location and its location, characteristics of the student body, and policies guiding teacher CPD. Others are the opportunities availed for CPD, benefits and outcomes of teacher CPD as well as the challenges and barriers teachers experience in their CPD.

These factors influence different participation aspects of teacher CPD. While the studies reported above do not always report consistent effects, they show that both personal and contextual factors influence participation rates and the likelihood that specific groups of teachers participate in CPD, the content teachers choose to learn and the methods that the teachers use. It can therefore be concluded that depending on the characteristics of the teacher and the context within which the teacher works, personal and contextual factors influence if and when teachers participate in CPD, the content teachers seek to learn, and the learning methods teachers use in their CPD. In essence personal and contextual factors influence the aims, content and learning methods that characterize teacher CPD.

2.4 Analytical frameworks on teacher CPD

Another approach to understanding teacher CPD that emerged from literature relates to the use and development of analytical frameworks on teacher CPD. Thus, in addition to researching teacher CPD practices and participation factors, different analytical frameworks have been proposed to improve our understanding of teacher CPD practices. Some models have presumed that teachers develop through stages and have therefore sought to explain teachers' professional growth and development in terms of stages (Day et al., 2006; Day & Gu, 2007) while other models have adopted a narrative-biographical approach that focuses on teachers' career stories and critical incidents that trigger and influence professional learning (Kelchtermans, 2004).

Focusing on the learning methods teachers use and borrowing the analytical framework by Foley (2000), Fraser et al. (2007) categorized teacher CPD practices depending on the degree of formality and the degree of planning. They argued that CPD practices could be categorized on a formal-informal axis and on a planned-incidental axis. When the axes are made to intersect, four groups of practices emerge: planned formal, where CPD is usually planned externally, e.g. chartered teacher module classes or university courses; planned-informal, where CPD is planned by teachers, e.g. web-based networks; incidental-formal, where CPD is incidental but structured, e.g., sharing professional experiences during assessment moderation meetings; and incidental-informal, where the interactions are both incidental and unstructured, such as staffroom chats.

Lewin and Stuart (2003) focused on how teachers are viewed, and consequently what role teacher CPD plays and the forms its takes. They identified two diametrically opposed ways of viewing a teacher, i.e., the teacher as a technician serving the system *versus* the teacher as a reflective practitioner. As a technician serving the system, the teacher has a restricted role of delivering the prescribed curriculum using predefined approaches, and therefore teacher CPD takes the form of telling the teacher what to do, when to do it, and how to do. In contrast, when the teacher is viewed as a reflective practitioner, teacher CPD takes the form of supporting the teacher to engage in critical and reflective practices because the teacher is expected to improve themselves, their students and their schools.

Kennedy (2014) had a similar focus on the role teacher CPD plays and modelled learning methods in terms of how well the methods foster professional autonomy and transformative practices. She thus identified three categories of teacher CPD, wherein teacher CPD could be transmissive, transitional or transformative. In transmissive teacher CPD, teacher autonomy is limited and the goal is to help teachers comply with requirements as they adopt and replicate particular practices without in depth change in values and beliefs. This description is similar to the CPD practices described by Lewin and Stuart (2003) when the teacher is viewed as a technician. In contrast, transformational models seek to enhance teacher autonomy by helping teachers internalize new concepts, reflect on, construct, and implement new knowledge while being aware of the social and political context of their work. Again, this description is similar to the CPD practices described by Lewin and Stuart (2003) when the teacher is

viewed as a reflective practitioner. Transitional models may be transmissive or transformational depending on their outlook.

Sachs (2011) categorized CPD practices in a similar way focusing on how well teacher CPD helps teachers to retool, remodel, revitalize or reimagine their profession. In retooling (similar to Kennedy's transmissive CPD), teachers acquire new skills or upgrade existing skills while in remodelling teachers seek to modify existing practices driven by the need to comply with changed government agenda. In revitalising CPD, the trigger is professional renewal and the aim is to rethink and renew practices. The category mirrors Kennedy's (2014) transformative CPD and Lewin and Stuart's (2003) reflective practitioner.

Focusing on the outcomes of teacher CPD, Harland & Kinder (2014) identified nine possible outcomes of teacher CPD in which impact on practice (i.e., development in classroom pedagogy) is the ultimate intention and outcome of teacher CPD. This outcome can be achieved directly by supporting teachers to adopt new and better teaching practices. Impact on practice can also be achieved indirectly through the other eight outcomes of teacher CPD. Harland and Kinder organised the outcomes in a hierarchy in which the lowest order outcomes relates to material and provisionary outcomes (e.g., obtaining physical resources from participation in teacher CPD), informational outcomes (e.g., becoming cognisant of background facts) and development of new awareness (i.e., perceptual or conceptual shits in assumptions). In the second order, teacher CPD leads to increased motivation and attitudinal outcomes (e.g., increased enthusiasm to implement new ideas and practices), affective outcomes (i.e., emotional outcomes such as increases in self-confidence) and institutional changes (such as development of consensus and shared meanings, collaboration and mutual support). The first order outcomes relate to value congruence (i.e., concurrence of values and codes of practice between those of the teacher and CPD provider) and increased knowledge and skills (i.e., development of deeper levels of understanding, theoretical rationales and critical reflexivity. This includes extensions in teachers' self-knowledge and awareness of adult learning practices).

Another approach to analysing teacher CPD takes on a more evaluative approach and focuses on conditions or practices that lead to a desired teacher CPD outcome. For example, Desimone (2009) and later Darling-Hammond et al. (2017) focused on

improved student learning outcomes as the principle aim of teacher CPD and identified CPD practices that correlate strongly with improved student learning outcomes. They identified strong content focus, active learning, coherence, sufficient duration, and collaborative and collective participation as CPD practices that are associated with effective teacher CPD. Other studies have identified similar characteristics of effective teacher CPD (Fischer et al., 2018; OECD, 2019; Olofson & Garnett, 2018; Postholm, 2012).

Teacher CPD has also been analysed as a goal directed activity, where effort is invested for specific returns. Learning is seen as an effort intensive activity that consumes time and resources, hence it must be motivated by the returns that accrue from it (Heystek, 2011). Teachers are thus viewed as rational actors who invest effort, time and resources judiciously with specific goals and outcomes in mind. They take initiative and act proactively in order to exert control over their lives and environments, and in particular their professional learning and careers (Goller & Harteis, 2017; Goller & Paloniemi, 2017; Thompson & Deis, 2004). This approach is nested in the rational choice theory which considers how beliefs, interests and opportunities influence goal oriented choices and actions (Hedström & Swedberg, 1996), and in this case, how teachers' beliefs, interests and opportunities influence teachers choices and learning practices.

Among other things, Rational Choice Theory explains how social situations influence the choices and actions of individuals. The starting point of the theory is that faced with multiple courses of action, an individual will choose the course of action that best satisfies their interests or preferences. Decision making is thus guided by considerations of existing incentives and sanctions. Second, if information to guide actions is not available or perfect, the individual then relies on his or her beliefs about possible courses of action and their likely outcomes. Individual action can thus be seen as the outcome of interests, beliefs, and opportunities. Third, the institutional context, in the sense of formal and informal rules, sets the available opportunities and incentives while influencing the beliefs of individuals(Ballantine & Spade, 2009; Buskens, 2015; Cairney, 2012; Hedström & Swedberg, 1996; Zey & Antonio, 2015).

An alternative approach conceptualizes teacher CPD as an adult learning process with the teacher viewed as a learner (Appova & Arbaugh, 2018; Beavers, 2009; Lawler, 2003). This approach, nested in the adult learning framework, focuses on the teacher as

a learner, her characteristics, and the based on those characteristics, conditions that lead to effective and impactful learning are identified. A foundational construct in this approach is that teachers are adult learners on account of their age. For example, unlike younger learners who are still anticipating their future adult roles, adult learners are fully engaged with their roles and responsibilities as adults (Henschke, 2009; Jarvis, 2004; Knowles, 1970). These adult based engagements in turn limit the time and resources available for learning, and necessitate that teacher learning be worthwhile before time and resources are committed to it (Lawler, 2003).

Other constructs from the adult learning framework on the nature of adult learners are then used to postulate conditions that lead to engaged, motivated and therefore effective learning (Beavers, 2009; Gregson & Sturko, 2007; Hensley et al., 2017; Lawler, 2003; Terehoff, 2002). Key among these postulates is the view that adults are self-directed learners, i.e., adults tend to be able to diagnose their learning needs, identify appropriate learning approaches and evaluate their learning outcomes (Brookfield, 2009; Gordon & Ross-Gordon, 2018; Henschke, 2009; Merriam & Bierema, 2014).

Summary on the analytical frameworks on teacher CPD practices

In order to better understand and explain diverse teacher CPD practices, researchers have proposed various analytical frameworks. The frameworks are broad and have focused on diverse aspects of teacher CPD, e.g., the age and stage-based characteristics of teachers; how teachers are viewed and consequently the forms teacher CPD takes; the learning methods that characterize teacher CPD; the outcomes and contents of teacher CPD; the rational-actor characteristics of teachers, and; the adult-learner characteristics of teachers.

Still, an integration of the personal and contextual factors that influence teacher CPD appears lacking. Moreover, while the frameworks are informative, they do not centre on the choices teachers make with regard to participation i.e., if and when to participate in CPD, the content to learn, and the learning methods to use. Instead, the frameworks appear to frame these choices as external to the teacher. The theoretical framework below seeks to address this gap.

2.5 Theoretical framework on teacher CPD

From the discussion on the characteristics of teacher CPD, it was concluded that teacher CPD is characterized multiple aims, diverse content, and a wide range of learning methods. And from the discussion on the factors influencing teacher CPD, it was concluded that teacher CPD is embedded in context and is influenced by interacting personal and contextual factors. These factors interact to influence if and when teachers participate in CPD, what content they learn and the learning methods they use. Borrowing from the analytical frameworks above, and in particular the view teachers are rational actors and that their professional development is an adult learning process, teacher CPD can thus be reconceptualised as a context bound and goal oriented adult learning activity, characterized by multiple aims, diverse content, and a broad range of learning methods.

This conception of teacher CPD is grounded on both the adult learning framework and the rational choice theory. As adult learners, teachers display the characteristics of adult learners which include engagement with adulthood roles and responsibilities and self-directed learning. In addition, as rational actors, teachers are goal-directed and act rationally taking into account the expected benefits and costs of their choices. Because adult learning is influenced by both the context and personal characteristics of the learners, contextual factors and personal factors set the aims and desired outcomes of teacher CPD, the content teachers can learn, and the learning methods teachers can use as part of their CPD. From these, teachers decide what aims to pursue, and consequently, if and when to participate in CPD, what content to learn, and the learning methods to use. Accordingly, teacher CPD practices can thus be explained as the outcomes of the rational choices teachers make with regard to their CPD, i.e., timing (if and when to participate), content (what to learn) and learning methods (how to learn). The choices teachers make and the factors that influence these choices are graphically summarized in the conceptual framework below (Figure 1).

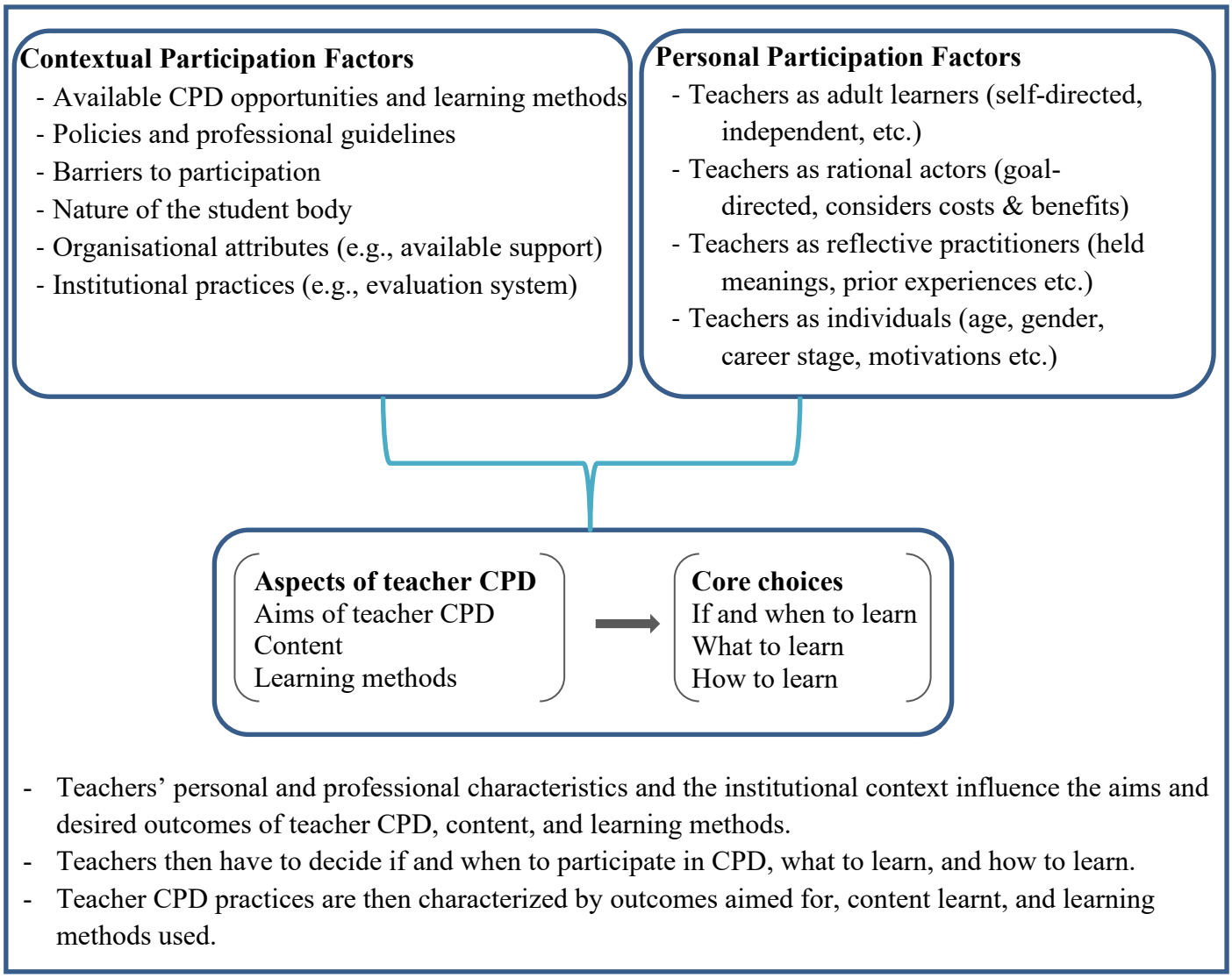


Figure 1:*Theoretical Framework on teacher's participation in CPD*

2.6 Implications of the theoretical framework

Starting with the view that teacher CPD is a context bound and goal oriented adult learning activity that is characterized by multiple aims, diverse content, and a broad range of learning methods, the theoretical framework views teachers as rational actors and adult learners who purpose their learning to attain specific outcomes. The theoretical framework can explain a large number of prior empirical observations while supporting the identification of empirically testable hypotheses on the interaction between teacher characteristics, teacher CPD practices, and the factors influencing teacher participation in CPD. Moreover, the theoretical framework leads to certain methodological implications. These are briefly reviewed below.

The theoretical framework implies that career stage and other age-based characteristics of teachers influence CPD practices. Past empirical findings support this conclusion. For example, Early Career Stage teachers have been shown to seek a wider range of content while, Late Career Stage teachers are more selective owing to their extensive experience. Middle career stage teachers are limited of time due to the non-teaching responsibilities they hold (Appova & Arbaugh, 2018; Masuda et al., 2013; Richter et al., 2011, 2019).

The theoretical framework also implies that learning practices will only be impactful if the practices agree with adult learning principles. In brief, these principles state that adults learn best when their learning is active, interactive, and relates to their social roles (Henschke, 2009; Knowles, 1970; Thompson & Deis, 2004). It therefore follows that as a form of adult education, teacher CPD can only be effective if it is active and interactive, relevant to the current needs of teachers, coherent and aligns with practice, and is of sufficient duration of time (Desimone, 2009; OECD, 2019).

From the identified aims and the strategic use of learning, teachers can be expected to be selective in their choice of learning content. As an example, teachers who feel they need to find better ways to support learning will concentrate on pedagogical content knowledge while teachers with new non-teaching responsibilities will seek general pedagogical knowledge to support their expanded responsibilities. Similarly, teachers can be expected to be selective in their choice of learning methods. For example, if a teacher seeks CPD for career development and existing policies recognize and reward formal learning only, it is logical to expect that the teacher will choose formal learning methods. A more flexible reward structure will on the other hand encourage the teacher to adopt more diversified forms of learning. However, if learning is not aimed at external rewards, teachers will also use methods that they find most effective. From a methodological point of view, the frequency of using a particular learning method should correlate with how helpful teachers feel the learning method is.

Since the learning outcomes are evaluated through an evaluation system, the focus of the evaluation system will influence what teachers choose to focus their learning on. Thus, if the evaluation system focuses on the mastery of practical knowledge and skills, teachers will choose to master these and how best to teach them. If on the other hand the evaluation system focuses on theoretical content, teachers will seek to master that

theory and how best to teach it. Similarly, if the curriculum is regularly updated to reflect technological progress, teachers will have to focus their learning on the new content.

The theoretical framework views teachers as rational actors who make their CPD choices taking into account the expected benefits and costs of their choices. Costs and benefits are a function of personal and professional attributes of teachers, such as age, gender, prior educational experiences, and career stage (Appova & Arbaugh, 2018; Fukao, 2016; McMillan et al., 2016; Meke, 2013). Teachers can thus be expected to face different costs, challenges and barriers and choose differently based on their personal and professional attributes. For example, Early Career Stage teachers who often receive lower salaries may lack the resources to meet the direct costs of tuition and will therefore participate less in formal CPD courses that have to be paid for. On the other hand, female teachers may participate less due to their gender-based restrictions and culturally imposed family responsibilities.

Given that learning is an activity that requires effort, how much support teachers receive for their learning also influences whether they will participate in CPD or not. Where teachers feel that they will be supported they are more likely to undertake CPD than when they do not. Support could come from their families, their colleagues, their administration and their employer. The degree of collegiality among the teachers could also positively or negatively influence CPD. Where there is a higher degree of collegiality among the teachers, they are more likely to learn together while supporting each other's individual learning.

The theoretical framework identifies the existence and influence of institutional practices and in particular existing policies. For example, the perceived value of teacher CPD is dependent on the existing incentives built into the career and professional guidelines that teachers are subject to. Further, teachers may participate in CPD due to external reasons such as professional requirements or government directives; in which case their choices for timing, content, and learning methods will be aligned to the external reasons. Therefore, from a policy making point of view, incentives, sanctions, and time based requirements for CPD can be used to influence how teachers participate in CPD (Bolam, 2000; Hardy & Lingard, 2008; Whitehouse, 2011).

By viewing teachers as adult learners who are goal-oriented and rational, the implication is that teachers are self-aware. Teachers are thus aware of what knowledge and competencies they need to develop and that awareness guides them in choosing the content they need to learn, and the methods most appropriate to them. Additionally, they are aware of their context and in particular, their ability to deal with the challenges that they have to face in their professional development. From a methodological point of view, self-awareness implies that, it is possible for teachers to provide information about their choices and practices, as well as offer insights explaining their choices and practices.

2.7 Chapter summary

This chapter has presented a broad overview of literature on teacher CPD, and in particular, the key attributes of teacher CPD: aims, content, and learning methods. It was noted that teacher CPD is characterized by a diversity of aims, diverse content, and a broad range of learning methods. Further, teacher CPD practices were found to be influenced by a range of factors, some of which relate directly to the personal characteristics of teachers, while others are context dependent. Borrowing from different analytical frameworks, teacher CPD was identified to be an adult education learning process. By viewing teachers as adult learners and rational choice takers, and using insights from the Adult Learning Framework and the Rational Choice Theory, a theoretical framework to explain the interaction of the factors influencing teacher CPD practices was then proposed to guide the rest of the study. In brief, teacher CPD practices can be viewed and explained in terms three choices: if and when to participate in CPD, what content to learn, and what learning methods to use. Having developed a theoretical framework on the CPD of teachers, the next two sections contextualize the study with respect to TVET teachers and the location of the study.

Chapter 3 Context of the Study: TVET and TVET Teacher CPD

The preceding chapter presented literature that guided the study. This chapter presents the context of the study. While context can be looked at from different perspectives, this study looks at context in terms of the setting or location of the phenomenon under study. In line with the preliminary assumption about the effect of factors, it is taken that within a given setting or location, and due to the unique characteristics of that setting, factors of interest vary (i.e., they may be present or absent or may take on particular values) and therefore influence the phenomenon under study leading to outcomes that are specific to that setting. Two locations of interest are identified: the location of TVET in the wider system of education and the geographic location of the study. The chapter begins by presenting this dual context before discussing TVET as one of the contexts of the study.

3.1 Dual context of the study

The preceding literature has led to the conclusion that teacher CPD is a form of adult education that is context bound. Apart from personal factors, various contextual factors that influence teacher CPD were identified. Contextual factors identified include the availability of teacher CPD opportunities, the costs, challenges, benefits and outcomes of teacher CPD, educational policies and teacher professional guidelines, the curriculum and evaluation system. Other factors included student type, and the type and location of the school.

These factors may be specific to a given geographical location. For example, the availability of CPD opportunities may vary with the geographic location of the school where teachers work. Similarly, educational polices may be specific to a particular country and her historical and cultural developments. Accordingly, context could refer to the geographic location within which teacher CPD takes place. Thus, the presence, absence, variations and consequently the effects of the contextual factors identified in the preceding chapter could be due to the geographic location of the phenomenon under study. Here, geographic location means more than a physical place, but refers to the history, culture, economic endowments etc. associated and embedded in that that location.

The presence, absence, variations and effects of the contextual factors identified above could also be due the location of a given type of education in the wider educational system. For example, the location of a given type of education in the education system (say, higher education or medical education) may lead to unique learning needs for the teachers involved in its provision, and consequently, the nature of their professional development. Consequently, and for the purposes of this study, context could refer to TVET as a specific form of education whose unique characteristics influence TVET teacher CPD. This sets the basis for a consideration of how TVET influences the learning needs of TVET teachers, the CPD opportunities available to TVET teachers, and how educational policies specific to TVET influence TVET teacher CPD.

This study therefore identified two contexts of the study: TVET as a specific context that influences TVET teacher CPD, and the specific location within which teacher CPD may be embedded. In this case, the specific location was Kenya. The rest the chapter describes the TVET context while the next chapter describes the location of the study.

3.2 Technical and Vocational Education and Training

As a form of education, vocational education takes diverse forms and is consequently referred to and described in multiple ways. It may be referred to as Apprenticeship Training, Occupational Education (OE), Technical Education (TE), Vocational Education (VE), Technical and Vocational Education (TVE), Vocational Education and Training (VET), Professional and Vocational Education (PVE), Career and Technical Education (CTE), Workplace Education (WE) and Workforce Education (WE) etc. Maclean & Lai (2011) noted that the use of these terms varies across regions.

In light of the multiple terms and different acronyms used to refer to vocational education the Second Conference on Technical and Vocational Education held in Seoul, South Korea in 1999 recommended that UNESCO and ILO develop a common concept of Technical and Vocational Education and Training (UNESCO, 1999, 2015). Subsequent publications by UNESCO use the term Technical and Vocational Education and Training and the acronym TVET[1].

[1] This study adopts this practice and uses the term TVET unless context dictates otherwise.

Noting that TVET spans different forms and levels of education, UNESCO defines TVET as a broad set of educational process which in addition to the *development of general knowledge*, involve the *study of technologies and related sciences* and the *acquisition of practical competencies* related to occupations in different sectors of economic and social life (UNESCO, 2001). The definition emphasizes the breadth, aims and content of TVET.

To make sense of the diversity of TVET and identify its essence, I reviewed different definitions and conceptions of TVET, and concluded that the essence of TVET is the learning and mastering of socially desirable techniques, -that is, the learning and mastering of specialized approaches of doing useful things. Because the techniques are based on scientific principles and their competent application requires a broad understanding of general principles, the learning, mastering and competent application of the techniques necessarily involves the learning of both general and scientific knowledge and the development of technical skills and practical competencies (Njenga, 2020a). This conceptualization of TVET highlights the purposes, knowledge base and learning methods that characterize TVET. Moreover, it is clear that TVET is a unique context in which technology and education converge.

To better explain TVET and distinguish TVET from other forms of education, I borrowed from Moodie (2008) and Cedefop (2017) and argued that TVET is distinguished from general education by its epistemological aspects (i.e., a bias for technical and practical/tacit knowledge supported by scientific knowledge), its pedagogical aspects (i.e., a requirement for experiential and practical learning), its teleological aspects (i.e., TVET may be taken as occupational preparation leading to formal certifications or as continuing and life-long learning focusing on improved task performance and career progression) and TVET's social-economic nature (i.e., a focus on practical arts and its occupational-vocational bias). Others definitive aspects of TVET are its organisational aspects (i.e., formal and informal aspects where TVET may be school based or work based), and TVET's system level aspects (basic/preparatory TVET, secondary TVET, post-secondary TVET focusing on crafts, technical sciences, engineering, and increasingly on other occupational fields) (Njenga, 2020a).

To explain the diversity of TVET, I argued that, because the techniques can be learnt and mastered at school *and or* in the workplace using either formal or informal learning

methods, the focus on specialized techniques explains why TVET has both formal and informal aspects and is associated with both school-based learning and workplace training. Further, depending on the level and complexity of the techniques learnt, TVET courses can take different lengths of time and lead to different academic qualifications. This explains why TVET is associated with different educational levels (e.g., basic, secondary, post-secondary etc.) and educational qualifications (artisan, craft, diploma, etc). And since the techniques may be learnt *and or* improved at any time, TVET is also associated with lifelong learning (Njenga, 2020a). From this delineation of the core aspects of TVET, it is possible to identify particular forms of TVET, such as formal TVET, informal TVET, dual TVET (i.e., a mode of TVET provision that combines both school-based and work-based learning), preparatory TVET, post-secondary TVET etc. Indeed, this study focuses on TVET teacher CPD practices in post-secondary TVET institutions in Kenya.

The purposes, knowledge base, and teaching and learning methods of TVET therefore show important differences when compared with those of general education. These differences impact on the professional characteristics of TVET teachers and consequently on the recruitment and professional development of TVET teachers. The next section takes a closer look at TVET teachers.

3.3 TVET teachers

TVET teachers are critical in the provision of TVET. They guide and support the learning of the scientific principles, technical skills and general knowledge that form the foundation of TVET. Owing to the wide profile of TVET, TVET teachers have an equally wide profile. Across the world, they may be referred to as teachers, trainers, instructors, tutors, or lecturers depending on the context and the historical usage of such terms[2]. TVET teachers may work in formal school settings such as schools or colleges, and provide instruction to students. They may also work as trainers or instructors public or private companies to help employees improve their competencies (Grollmann, 2008; Misra, 2011).

TVET teachers may be recruited and trained in different ways and indeed many TVET teachers are recruited and trained in a manner mirroring the recruitment and preparation of general education teachers. In cases mirroring general education teachers, TVET

[2] This book will use the term TVET teachers unless the context demands otherwise.

teachers are recruited on the basis of their prior education in both the content they are expected to teach (i.e., subject matter knowledge) and teaching methods. Such TVET teachers have already been trained to work as teachers *before* being employed and assigned teaching duties. Other TVET teachers are however trained to work as teachers *after* being employed and assigned teaching duties. In this case, the teachers are recruited and assigned teaching and training duties on the basis of their prior work experience and specific occupational knowledge but are expected to are expected to acquire pedagogical knowledge as they teach.

In the second case above, TVET teacher training may focus exclusively on pedagogics and teaching methods on the basis that the teachers already possess subject matter knowledge and practical experience. Teacher training may also be consecutive to studying subject matter, e.g., a second teaching degree after a first degree focused on the subject matter knowledge. Teacher training may also be integrated or co-current, and integrate the learning of subject matter knowledge with training in educational sciences (Grollmann, 2008; Misra, 2011).

3.3.1 Dual professionals

TVET teachers are seen as unique from other teachers with the defining feature being their dual professionalism: they are professionals in their trade or subject areas and are professionals as teachers (Andersson & Köpsén, 2015; Avis & Orr, 2014; Tran & Le, 2018). An alternative view of the professional duality of TVET teachers is in that many TVET teachers complete their initial teacher education while on the job as teachers. They are thus professionals as technical specialists, but trainees themselves as teachers (Lucas et al., 2012).

The uniqueness of TVET teachers is further demonstrated by the breadth of their professional roles, which as Grollmann (2008) notes, has been expanding over time. Apart from the traditional roles of teaching, supporting learning, and evaluating learning, TVET teachers are also expected to develop curricular, and be involved in the management of their institutions. To support student learning, TVET teachers are also expected to work as student mentors and counsellors. Other roles include working as industry trainers, safety advisors, and assessors. TVET institutions, managed largely by TVET teachers, are also expected to support regional and sectorial development. These

roles impact on the professional identity of TVET teachers and demand that TVET teachers develop new and broader competencies (Avis & Orr, 2014; Tran & Le, 2018).

3.3.2 Professional competencies of TVET teachers

The preceding discussion demonstrates the wide profile of TVET teachers as well as the diverse competencies TVET teachers must possess. In researching TVET teacher professional development, scholars have relied on Shulman;s (1986) classification of teacher competencies with minor modifications to account for the vocational context (Gamble, 2013; Hoekstra et al., 2018). For example, Gamble (2013) observes that in addition to subject content knowledge and pedagogical knowledge, vocational teachers are also required to possess practical workplace experience. In addition to these, Choy & Haukka (2009) add: knowledge and understanding of workplaces, working life and society; the ability to engage in self-reflection, and; the ability to research and evaluate practitioner's and student's activities, occupational knowledge, pedagogical and curriculum strategies.

Antera's (2021) review of empirical literature on the professional competencies of vocational teachers found that the professional competencies of vocational teachers are taken to relate to vocational teachers' participation in practice (both in teaching and in the trade areas) and vocational teachers having up-to-date knowledge of legal and practical aspects of the vocations they prepare students for. Other aspects of the professional competencies of vocational teachers relate to the teaching skills teachers should have, a self-development attitude, humanistic values, responsibility and accountability. In their systematic review of literature on vocational teacher CPD, Zhou et al. (2022) found that researchers identify similar categories of the professional competencies vocational teachers possess or seek to develop.

These competences highlight that a definitive feature of the professional knowledge and competencies of TVET teachers is the focus on technical knowledge related to their vocational areas, knowledge of workplaces and working-life, and how their vocations relate to the rest of the society. This aspect further highlights the dual nature of their profession.

This dual character and focus on technical knowledge and work-related competencies imply that some of the issues that confront TVET teachers are different from those

faced by general education teachers. These issues include the need to remain up to date with the specialist knowledge and skills related to their vocational areas and the need to maintain close contact with industry in the face of rapidly changing technology and modes of work (Rawkins, 2018; Tran & Le, 2018; UNESCO-UNEVOC, 2012).

These needs are explained by the fact that TVET teachers teach knowledge and skills that are dynamic and in constant change owing to rapid scientific and technological progress. Rapid scientific and technological progress thus demands that TVET teachers keep abreast of changes in technology and science, and remain in the networks within which such knowledge is transferred and shared (Broad, 2016; Rawkins, 2018; UNESCO-UNEVOC, 2012).

Related with the need to keep abreast with technical and scientific knowledge is the need to adjusting pedagogical practices such that pedagogical practices are in harmony with new content knowledge. They must for example learn how best to teach new scientific and technical principles that underlie their vocational areas. TVET teachers must therefore keep updating and refining their skills in pedagogy to ensure that high learning outcomes attain (Rawkins, 2018; UNESCO-UNEVOC, 2012).

3.4 TVET teacher CPD

From the review of literature in the second chapter, it was concluded that teacher CPD practices are characterized by different aims, content, and learning methods. As a form of teacher CPD, TVET teacher CPD is similarly characterized. However, the aims, content and learning methods are influenced by the TVET context as discussed below.

3.4.1 Aims

The uniqueness of TVET teachers as dual professionals who must possess a diverse set of competencies and who must work to continually sharpen their competencies makes it clear that TVET teachers must engage in Continuing Professional Development (CPD). TVET teacher CPD enables TVET teachers to develop their professional competencies, keep up to date with scientific and technical progress, and teach new content using appropriate methods. In addition, TVET teacher CPD supports TVET teachers to adopt learner centred teaching practices. Changes in curricular are often accompanied by changes in general educational policies, which TVET teachers must be aware of and implement. By supporting TVET teachers to understand new curricular and changed

educational policies, TVET teacher CPD supports the development and implementation of new curricular and educational policies (Cedefop, 2009; Lucas et al., 2012; Rawkins, 2018).

Another factor necessitating TVET teacher CPD is the introduction of new roles to TVET institutions and by extension to TVET teachers (Grollmann, 2008). In addition, teacher CPD provides teachers with the ability to maintain and improve quality while dealing with the challenges of teaching including boredom and alienation (Gaikhorst et al., 2015; Guskey, 2002b). By ensuring that TVET remains at the forefront of technical developments, CPD can improve the status and esteem of TVET, while enabling TVET teachers to expand their career prospects and the general professionalization of the teaching profession (Misra, 2011; Rawkins, 2018).

In their review of past empirical research on TVET teacher CPD, Zhou et al. (2022) used Harland and Kinder's (2014) model of the outcomes of In-service Teacher Training (INSET) and identified that the learning outcomes vocational teachers get from their CPD are similar to those general education teachers get. These outcomes included improvements in knowledge and skills, changes in teaching practice, affective outcomes, value congruence, motivational and attitudinal outcomes. Other outcomes were development of new insights including shifts in assumptions about teaching practices and the curriculum.

3.4.2 Content

These aims of TVET teacher CPD underlie the content that TVET teacher CPD must develop. In a review of literature, Cedefop (2009) found that TVET teacher CPD is frequently aimed at helping TVET teachers:

- Remain relevant by maintain awareness of technical and scientific progress, and to integrate that awareness in teaching by using it to guide the selection of knowledge and skills that learners must learn to be relevant in the labour market.
- Develop learner centred competences such as coaching, mentoring, and supporting self-directed learning
- Use ICT to support learning
- Develop a broadened view of clients, which includes students, parents, employers, local communities, their needs, and how to respond appropriately to client needs.

- Develop peripheral competencies, such as guidance and counselling, research, etc.
- Update their knowledge of the education system, its changes and how it interacts with the rest of the social system. This includes knowledge of the curricula, qualification frameworks, etc.

3.4.3 Learning methods

Researchers have in the past sought to identify the learning methods TVET teachers use and the frequency of using such methods. In their systematic review of literature on the professional learning of vocational teachers, Zhou et al. (2022) identified four categories of learning activities. These are: (a) Pre-defined professional development programs which are purposefully designed and therefore formal in character such as formal education and academic workshops, (b) Self-directed learning activities which involve learning by doing, reflection and active exploration of their new ideas and approaches in the workplace, (c) Collaborative learning activities in the school which involve the active exchange of ideas and practical information through activities such as peer collaboration or informal discussions, and (d) Industry-based learning activities whereby vocational teachers visit industries and other work places for the purposes of learning such as work placements.

In her study on the professional development of Vocational Teachers in Hungary, Bükki, (2022) identified three basic categories of professional learning activities. In the first category, learning may be unplanned and therefore incidental and informal resulting in the development of tacit knowledge. In the second category, learning is intentional but non-formal. In the third category, learning is formal and has an explicit purpose and may take place within or outside the school.

In their study focusing on CPD practices by Swedish TVET teachers, Andersson & Köpsén (2015, 2018) identified similar learning methods. However, they reclassified them into two categories. In the first category, TVET teachers learn through activities that involve crossing the boundary between the school and the world of work such as study visits to work places, coordinating student work-placements, and work-placement for TVET teachers (i.e., Lecturer Industrial Attachment). In the second category, TVET teachers learn by participating in traditional formal and informal learning activities such

as participating in conferences, attending short and long courses (for example at a university), reading professional literature, and by participating in content and pedagogical improvement activities. In a similar studies focusing on vocational teachers in China (Zhou et al., 2021) and Britain (Broad, 2016), similar learning activities were identified.

3.5 Challenges in the provision of TVET teacher CPD

However, despite its importance, effective TVET teacher CPD remains unavailable to many TVET teachers across the world (Axmann et al., 2015; Rawkins, 2018). The lack of effective CPD means that even when TVET teachers have formal teaching qualifications, their knowledge and skills may be out-dated. This is especially the case given the rapid pace of technical and scientific changes that underlie technical processes and new modes of work. In fact, Gamble (2013) notes that TVET teachers are in general confronted by the lack of systematic trajectories to ensure that they develop and keep their competencies up to date.

Broad & Lahiff (2019) identified two reasons why TVET teachers face difficulties in developing and keeping their competencies up to date. The first reason relates to the fluid and temporal nature of technical and scientific knowledge. Conceptualizing technical and scientific knowledge as being in constant motion within a temporal and spatial network, they point out that the temporal nature of knowledge requires it to be in constant movement and circulation. However, once teachers move away from industry and work contexts (where vocational knowledge is formed, articulated and circulated), they are out of the network of relations within which professionals share and disseminate knowledge. The second reason is more practical: maintaining expertise requires resources and time which their employers are often unable to provide (Broad, 2016; Broad & Lahiff, 2019). Thus, apart from being cut off from the system of generating and maintain knowledge, TVET teachers also face practical difficulties in accessing learning opportunities.

These difficulties extended to accessing pedagogical content knowledge that supports teaching subject matter in TVET. Hoekstra et al. (2018) observed that due to the specialized nature of the subject matter in TVET, there often lacks formal learning opportunities focusing specifically on how to best teach such content.

Various studies provide empirical support to the observations made above. For example, Serafini (2018) found that TVET teachers in Italy lack relevant CPD opportunities, while Dymock & Tyler (2018) found that TVET teachers in Austria lack systemic provision of CPD to meet their needs. In both countries, these challenges are compounded by the lack of incentives to encourage TVET participation in CPD, and lack of enforcement mechanisms for mandatory CPD as laws or registration requirements.

Access to TVET teacher CPD appears to be particularly difficult in developing countries and Sub-Saharan Africa in particular. In a review of TVET teacher education in Africa, Grijpstra & Papier (2015) found TVET teacher CPD in African countries to be irregular with TVET teachers lacking systematic exposure to industry. TVET teacher CPD in Africa also often relies on the will and financing of individual teachers. However, given their limited income, CPD financed using teachers using own income tends to be of little scope and insufficient to bring teachers up to date with industry standards (Rawkins, 2018). In the alternative, governments in Africa have in the past relied on donor funding to finance the provision of CPD to TVET teachers. However, rather than being systematic and on-going, donor financed teacher CPD tends to be ad hoc in response to the availability of donor funds. Such CPD provisions are also mediated if not directed by donor priorities rather than the needs of TVET teachers (Christie et al., 2004)

The beliefs guiding teacher CPD have also been found to be wanting. Christie et al. (2004) observe that in many cases, provision of teacher CPD in Africa adopts the view that African teachers are defective due to low entry qualifications, lack of initial teacher education (ITE) or insufficient ITE (whether the insufficiency is real or merely perceived), and the general lack of past CPD. Providers thus adopt what Lewin & Stuart (2003) call a “defect typology” in which, the teacher is seen as incomplete, inefficient and obsolete; a defective technician who is unable to serve the system and institution owing to improper prior training. Teachers in turn react negatively to such an approach and fail to embrace the content being offered.

These challenges are often compounded by the lack of accurate data and statistics on TVET teachers and their professional development. In their review, Grijpstra & Papier (2015) found that a recurrent challenge was the lack of data on TVET teachers and

those training to become TVET teachers. Without data, planners and policy makers lack critical insights that ensure that plans and policies align with needs of TVET teachers. Earlier, Christie et al. (2004) noted that due to poor record-keeping and a lack of indigenous African research, information on teacher CPD practices remains elusive. Instead, what is often available are evaluation reports of donor projects.[3] Moreover, available research from Sub-Saharan Africa is not always of high quality nor high relevance (Haßler et al., 2020).

Another challenge has been the failure to differentiate general teacher CPD and TVET teacher CPD. The failure to focus CPD provision to the needs of TVET teachers results in CPD that is largely irrelevant to TVET teachers. This further depresses participation of TVET teachers in available CPD (Grijpstra & Papier, 2015; Rawkins, 2018). Maksimovic (2016) discusses this challenge in the Serbian context where VET teachers are not seen as a separate category of teachers and the policy framework for all other teachers applies to vocational teachers as well. In this case CPD requirements and provision fail to respond to the unique needs of TVET teachers and therefore leads to sub-optimal outcomes. Related to this challenge has been equating professional development with attaining higher academic degrees. While academic degrees are not bad in themselves, they often lack in contextual relevance and fail to focus on many of the aspects needed to support effective teaching and learning in TVET (UNESCO-UNEVOC, 2012).

A review of the challenges above, leads to the conclusion that are strongly linked to the developing-country status of the countries in Sub-Saharan Africa. Here, developing-country status is taken to refer and imply limitations in different forms of capital. Capital is in here conceptualized as productive capacity, and defined as systems or mechanisms that enhance different forms of economic production. Capital includes physical infrastructure (e.g., workshops, machines and laboratories), human capital (i.e., technical knowhow embedded in people), financial capital, and capital in the form of

[3] Zhou et al. (2022) could only include one study from SSA in their systematic review on vocational teachers' professional learning.

Haßler et al. (2020) did not find any TVET-related publications for almost one-third of the nations in SSA in their extensive review of literature on TVET research in Sub-Saharan Africa (SSA).

Tripney & Hombrados (2013) found only one study from SSA on their systematic review of studies relating to TVET for young people.

institutional frameworks that support productivity (Bourdieu, 1986; Todaro, 1992; Todaro & Smith, 2012).[4]

As developing countries, Sub-Saharan Countries have limited capital to support TVET teacher CPD. Limitation in these types of capital then lead to the challenges identified above. For example, limited financial capital to facilitate teacher CPD, a limited institutional framework (e.g., policies) leads to ad-hoc provision of TVET teacher CPD, while a small number of researchers leads to limited research. It is also clear that the limitations in different forms of capital reinforce each other and lead to the persistence of the challenges.

3.6 Chapter summary

This chapter began by identifying the dual context of the study, and went ahead to describe TVET as unique context that influences the aims, content and learning methods of TVET teacher CPD. In brief, the uniqueness of TVET in the wider education system was related to its teleological, epistemological, and pedagogical aspects. TVET seeks to prepare learners for the world-of-work by developing their general, technical and scientific knowledge using learning methods that have a strong practical and experiential bias. The purposes, knowledge base, and teaching and learning methods of TVET therefore show important differences when compared with those of general education. These differences impact on the professional characteristics of TVET teachers and consequently on the recruitment and professional development of TVET teachers.

As facilitators of the learning of the general knowledge, scientific principles, and technical and work-related competencies that form the foundation of TVET, TVET teachers were found to be dual professionals who must possess professional competencies in their technical fields as well as professional competencies in teaching. This dual professional identity was found to influence the aims, content and learning methods of TVET teacher CPD, while presenting unique challenges.

[4] While Bourdieu (1986) identified economic, cultural and social capital, here these forms of capital are identified in their aggregated and differently presented forms, e.g., human capital is a form of both cultural and social capital (see for example Glaeser et al. (2002), while financial capital may be looked at as a more liquid form of economic capital.

While research on TVET teacher CPD documents learning activities similar to those used by general education teachers, TVET teachers were also found to use additional methods that support TVET teachers to develop the knowledge and skills in the vocations they prepare their students for and to support them to remain up-to-date with modern and emerging work-practices. These learning methods include industry-based learning activities (i.e., learning activities situated in industry, including working in a part-time job or work placement). Use of industry-based learning activities is emphasised because it supports the development of work-life competencies that cannot be developed within the school.

However, by being in-class and outside the network of relations within which technical knowledge is developed and circulated, TVET teachers were found face challenges in developing and keeping their professional competencies up to date. Moreover, given the nature of their subject content knowledge, as well as its rapid pace of change, TVET teachers face challenges in accessing relevant pedagogical content knowledge related to their subject areas. In addition to these challenges, TVET teachers are constrained of time and resources to facilitate their CPD. Others challenges relate to the lack of a positive view of TVET teachers and an appreciation of the complexity of TVET teaching.

These challenges were found to be particularly acute within developing country contexts within Sub-Saharan Africa, where, deficiencies in capital (financial, technical knowhow, and institutional frameworks) lead to limited CPD opportunities for TVET teachers. The next chapter looks at the other context of the study, i.e., the geographic location of the study, which happens to be a developing country in Sub-Saharan Africa.

Chapter 4 TVET and TVET Teacher CPD in a Developing Country: The Case of Kenya

The previous chapter has taken a comprehensive look at TVET and TVET teacher CPD. The chapter concluded by identifying some of the challenges that confront TVET teacher CPD in Sub-Saharan Africa. This chapter takes a closer look at TVET and TVET teacher CPD in Kenya, one of the many Sub-Saharan African countries where TVET teacher CPD research remains limited. The chapter provides an overview of education and TVET in Kenya and highlights recent policy changes to improve access and quality. The chapter then reviews financing, teaching and examination practices in the TVET sector and the status of TVET teacher CPD in Kenya.

4.1 Education in Kenya

Kenya is a developing country in East Africa with a population of 48 million, and a GDP per capita of 186,297 KSh. (approx. 1,840 USD) at current prices (KNBS, 2019) and Human Development Index of 0.58 as (UNDP, 2019), accordingly the Kenya is classified lower middle-income country.

Agriculture is the biggest sector of the economy generating 34 per cent of GDP, mostly from growing of crops (27 per cent of the GDP). Other important sectors include manufacturing and construction which generated 7.7 and 5.4 per cent of the GDP respectively (Kenya National Bureau of Statistics [KNBS], 2019b, p. 23). Recent government efforts have been aimed at reducing reliance on subsistence agriculture, expanding the manufacturing and services sectors, and improving access to post-secondary vocational education (Ministry of Education Sector Working Group, 2019).

Kenya is a constitutional democracy with a devolved system of government, comprising of the national government and 47 semi-autonomous county governments. The president, elected by popular vote, is the head of state and the executive arm of the national government. County Governors, also elected by popular vote, oversee the administrative functions of the 47 counties. The legislator consists of parliament, whose members are elected by popular vote at the constituency level, and the senate whose members are elected by popular at the county level. At the county level, ward representatives, constitute county assemblies which develop local laws and play oversight over the county governments. The judiciary is independent and is headed by a

chief justice. Various independent constitutional commissions are responsible for specific functions; for example, the Judicial Service Commission is responsible for promoting and facilitating the independent and effective administration of justice, while the Teacher Service Commission is responsible for the recruitment and management of teachers.

The management of education in Kenya is shared by both levels of government. The national government is responsible for primary, secondary, post-secondary, and university education. The county governments are responsible for early childhood education and post-primary vocational training. However, the national government, plays the dominant role; both due to its size and its bigger portfolio. The ministry of education under the national government is in fact one of the largest ministries, both in terms of budget and human capital. Its other functions include the management of teacher training, national examinations, curriculum development, and related functions.

Kenya's system of education is in transition, both quantitatively and qualitatively. Quantitatively, the system has undergone rapid expansion, on the one hand due to a growing youth population and on the other due to efforts by the government to expand access. Efforts by the government include the 2003 declaration that primary education is free and the attendant efforts to actualize the declaration. Later in 2008, the government made secondary education tuition free and committed to 100 % transition from the primary to the secondary level. In 2016, the government committed itself to 100% transition from the secondary level to the post-secondary level. The government of Kenya therefore continues to spend a significant portion of its budget on the education sector. As of 2018, education finance accounted for 14.9 per cent of total government expenditure (Ministry of Education Sector Working Group, 2019; UNESCO-UNEVOC, 2018).

The efforts by the government have led to expansion of access. For example, in 2018, the Gross Enrolment ration in Primary Education (ISCED 1) was 104 per cent. The high ratio reflects expanded access and is an outcome of efforts to enrol children and adults who had dropped out before they completed the primary cycle. At the lower secondary level (ISCED 2) the Gross Enrolment Ratio was 97.4 per cent, and 68.5 per cent for the entire secondary education level (ISCED 3). The expansion has been supported by an increase in the number of schools and teachers. For example, secondary schools

increased from 9,966 in 2016 to 11,399 in 2018 (Ministry of Education Sector Working Group, 2019). However, gross enrolment at the post-secondary level remains low (Boukary & Walther, 2016). Multiple policy incentives have therefore been instituted to attain a 100% transition rate to the post-secondary level. One such initiative involves availing school fees and out-of-pocket financing to all students joining post-secondary educational institutions at low and deferred interest rates. The loans scheme is managed by the Higher Education Loans Board. Other initiatives are the building of new post-secondary training institutions and the expansion of existing institutions.

The quantitative expansion has been supported by changes in the legal framework for education in Kenya. Education has been recognized as a basic right and the government has been tasked with ensuring attainment of this right. In particular, the 2001 Children's act entitles every child to free and compulsory primary education and the 2010 Constitution states that education is a basic right for every child. Other laws, for example the Basic Education Act of 2013, the Technical, Vocational Education and Training Act of 2013, and the Universities Act of 2012 seek to create a supportive legal framework for expanded access to education. Various sessional papers by the government have also been developed to supplement these laws.

The quantitative expansion has gone hand in hand with qualitative changes. Of note is the transition to Competency Based Education and Training from the former 8-4-4 system. The 8-4-4 system was adopted in 1984, following recommendations of the Mackay commission. The commission had been tasked with reviewing the then state of education and advice the government on how best to reform the system of education into one that can help the country meets its development needs. The commission recommended scrapping the then existing 7-4-2-3 system of education, wherein students spent seven years in primary school, fours year in lower secondary and later two years in senior secondary before proceeding to university for three years. Primary and lower secondary education offered basic education while senior high school offered pre-university education. The multiple stages were blamed in part for the low transition rates and consequent lower education survival rates.

The 8-4-4 system has three stages: 8 years of basic primary education followed by 4 years of secondary education, and then 4 years of university education. These first twelve years form the basic education component of the system, after which students

can take up either university-based higher education or non-university tertiary education. Only a minority of secondary school students proceed to university. Majority of students proceed to post-secondary educational training institutions, such as technical training institutes, primary teacher training colleges or medical training colleges, for two-year craft certificate courses or three-year diploma courses. The format of the 8-4-4 reveals a strong focus on academic education and how non-university post-secondary education was treated as a substitute to university education rather than a key part of the system. Noteworthy, is also the fact that the 8-4-4 system did not outline learning at the pre-primary level.

The 8-4-4 curricular had been developed with a strong vocational component. At the primary level exposure to vocational subjects such as Arts and Crafts and Agriculture was meant to create awareness and interest. At the secondary level, more detailed studies of the subjects were aimed at encouraging exploration and identifying areas of interest. Students take what are called industrial subjects. Most schools offer a choice between Agriculture and Business studies, both of which do not require significant capital to provide. Schools with more teachers could offer other choices including computer studies and home science. Old well-established schools and some that had been established as special technical schools offered wider choices including metal work, automotive mechanics, electrical technology, and aviation studies. Students can then go on to master and specialize at the tertiary level (Kerre, 2019).

Due to cost and implementation challenges, the vocational component at the primary level had been watered down, more so after the recommendations of the Koech commission of 1999 (Oketch & Peliwe, 2017). Despite the vocational component, the 8-4-4 system was heavily criticised as being knowledge based and overly theoretical and failing to address emergent needs such as digital literacy. Its approach to evaluating learning was also blamed as having led to teaching and learning that focused on students being able to recall what was learnt, rather than the on the development of valuable and demonstrable competencies. The 8-4-4 was also seen as long overdue for comprehensive review, having been developed nearly thirty years ago with only minor reviews done along the way.

The 8-4-4 system is being phased out and replaced by a new system. The new system of education, referred to as the Kenyan Competency Based Curriculum, was developed to

address the concerns raised over the 8-4-4 systems. **Figure** 2 shows the organisation of the new competency-based system of education in Kenya.

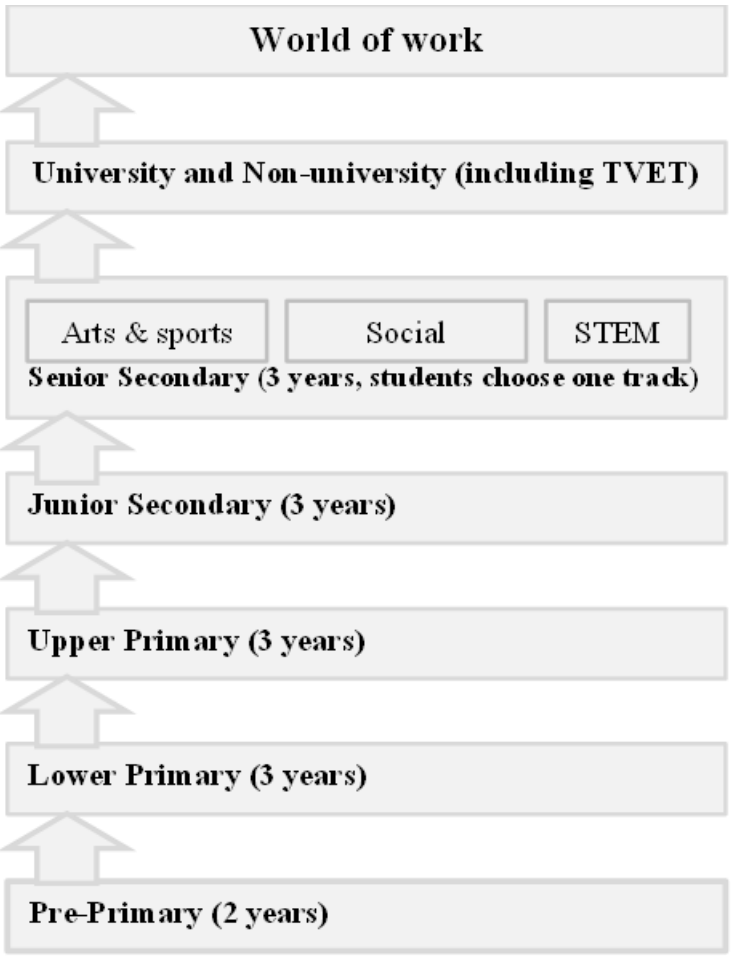


Figure 2: *Kenya's system of education under the competency-based curriculum Adapted from: KICD 2019*

The system consists of three stages. The first stage starts with two years of pre-primary education, referred to as Pre-Primary I and II. Lower Primary Education consists of Grades 1, 2 and 3, while Upper Primary Education consists of Grades 4, 5, and 6. The secondary education stage follows starting with Lower Secondary from Grade 7 to Grade 9, i.e., three years, followed by three years of Senior Secondary Education which terminates at Grade 12. The third stage is the Tertiary Education level, where students either proceed to university or post-secondary training institutions. University programs will be a minimum of three years while non-university programs will take between two and three years (Kenya Institute of Curriculum Development, 2019).

A core aim of the system is to support the development of valuable skills and competencies and their immediate application in real life settings. Learners are expected to join pre-primary at four years of age. The pre-primary years and lower primary

grades form the foundational level. In this level, learners are expected to develop basic skills and literacy. The upper primary and lower secondary grades constitute the intermediate level for learners aged between nine and fifteen years of age. In this level, learners are expected to develop awareness of different vocations. The Senior Secondary stage has both general and vocational tracks and learners can choose their vocations and start developing their vocational skills. At the tertiary or post-secondary level, learners are expected to develop full competency in their vocational areas. A key departure from the 8-4-4 system is the approach to the evaluation of learning. Previously, evaluation was largely summative using pen-and-paper based examinations. The CBC system places significant weight on formative assessment of diverse competencies (Kenya Institute of Curriculum Development, 2019).

4.2 TVET in Kenya

The foregoing foregrounds the provision of TVET in Kenya. As with most countries, both formal and informal TVET systems exist in Kenya[5]. The informal system caters to the needs of learners who are not enrolled in the formal system of education. Training takes place in work-sites or in enterprises in the micro- and small-scale enterprises that form the informal sector of the economy. The training is hands-on, practical, and task relevant. However, informal TVET lacks formality (e.g., pre-defined curricula, direct government regulation etc.) and usually skilled workers offer training to apprentices on the basis of informal training agreements. Owing to the lack of well-developed curricula, such training often fails to provide sufficient theoretical grounding (Sifuna, 2020; TVETA, 2020).

Within the formal TVET system, both public and private vocational training institutions offer training following well defined curricula in such trade areas as engineering, ICT, business and commercial studies, agriculture among others. The formal TVET system is thus characterized by formal learning facilitated by trained TVET teachers working in registered training institutions and leading to the award of recognized certification.

Formal TVET training leads to well defined qualifications depending on the learning programs students enrol to. Formal TVET programs may lead to the award of artisan

[5] While this categorization is informative, it is not exhaustive. For example, it is possible to identify non-formal provision, where despite formal elements, the provision falls outside formal system of education (Haßler et al., 2020).

certificates, craft or diploma certificates[6]. TVET institutions in Kenya may therefore be classified based on the entry characteristics of students and the qualifications students obtain.

Vocational Training Centres, referred to as Youth Polytechnics in the past, offer training to students with primary level education (i.e., ISCED 2). The study programs in Vocational Training Centres lead to the award of artisan certificates (ISCED 3). Artisan level programs are offered to learners who completed primary school but could not proceed to secondary school or to adults already in work who wish to obtain formal education certificates in their trades. The duration of the training depends on the organisation offering the training. This may range from as little as six months to two years. For institutions enrolling younger learners without secondary education, the longer duration is used to support the psycho-social development of the young learners. The certification of learning at this level is done through what are called Government Grade Tests, stating with Government Grades Test I, the lowest to grade test, to Government Grade Test III, the highest. These tests have a strong practical orientation. The grade tests are conducted by the National Industrial Training Authority.

Technical and Vocational Colleges (TVCs), often referred to as Technical Training Institutes, are post-secondary, non-university training institutions. They enrol students who have competed secondary education (ISCED 3) and offer craft certificate programs that run for two years and diploma certificate programs that run for three years (ISCED 4). Craft courses have a lower theoretical base while the diploma courses have a stronger theoretical focus. Students with higher entry scores (as provided by the summative evaluation conducted at the end of the secondary school cycle) take diploma courses. With a TVET diploma, students may then enrol at one of the eleven National Polytechnics for a Higher National Diploma (ISCED 5) which takes an additional two years.

The certification for the award of the craft, diploma and Higher National Diploma certificates is done by the same body, i.e., the Kenya National Examinations Council (KNEC). KNEC is an agency under the ministry of education established to conduct evaluation of learning on behalf of the government. KNEC is mandated to assess and

[6] In the Kenyan context, universities award *degree certificates,* while non-university institutions award *artisan, craft and diploma certificates*

certify learning by students following curricula developed by the Kenya Institute for Curriculum Development (KICD) for primary, secondary and post-secondary education. Development of curricular for TVET programs is also done by the Kenya Institute of Curriculum Development. These functions had previously been transferred to TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), but the government rescinded the transfers on account of task and role duplication (Ministry of Education Sector Working Group, 2019; UNESCO-UNEVOC, 2018; UNESCO Institute of Statistics, 2022).

While technical universities exist in Kenya and could be considered as part of the formal TVET sector, formal TVET programs are pre-dominantly post-secondary and non-university. On this basis, this study focused the continuing professional development of TVET teachers within the formal, post-secondary, non-university setting.

The government of Kenya views TVET as critical for social and economic development. TVET is seen as essential for developing the skills and competencies the country needs for economic transformation from an economy that is largely based on agriculture to one that is based on manufacturing and services. TVET is seen as vital in the supply of critical manpower needed to support the economy while meeting diverse the educational needs of individuals. For example, the current goal is to increase TVET enrolment from 446 to 780 per 100,000 people by year 2022 and provide adequate opportunities for accessible Competency Based Education and Training. As such, TVET receives prominent mention in Kenya's economic development documents, key among these is Kenya's Vision 2030, the National Education Sector Strategic Plan, and various educational sessional papers (2012, 2014, 2019) (Ministry of Education Sector Working Group, 2019, p. 20).

The attention has led to an increase in the number of both TVET students and the number of training institutions. Student enrolment in Technical and Vocational Colleges increased from 101,108 students in year 2016 to 175, 278 by year 2018. Vocational Training Centres recorded a smaller increase, with enrolments increasing from 80,905 to 107, 680 in the same period (Ministry of Education Sector Working Group, 2019).

The number of public and private TVET institutions increased rapidly between since year 2016. For example, whereas there were only 53 public Technical and Vocational

Colleges in 2016, the number had more than doubled by year 2018 and had more than quadrupled by year 2020. After the TVET Act of 2013, all technical training institutions were required to be registered and accredited by the TVET Authority, and as of 2018, 1,918 institutions had been accredited.

Table 1 shows the increase in the number of public and private TVET institutions in Kenya between year 2018 and 2020 (Ministry of Education Sector Working Group, 2019).

Table 1: *Public and private TVET institutions 2018-2020*

Category	2018	2019	2020
Public Vocational Training Centres (VTCs)	1200	1200	1200
Private Vocational Training Centres	63	74	86
Public Technical and Vocational Colleges (TVCs)	109	191	238
Private Technical and Vocational Colleges	645	742	843
Technical Trainers College	1	1	1
National Polytechnics	10	10	11
Total	**2,028**	**2,191**	**2,379**

Source: Ministry of Education Sector Working Group (2021, p. 27)

Apart from increasing the number of TVET intuitions, other policy initiatives have supported the increase in student enrolments. For example, students can join the appropriate TVET institutions irrespective of the student's age or when the student completed their primary or secondary education. Further, the government has subsidized training fees in the training institutions while the Higher Educations Loans Board provides student loans to help students meet their learning costs. Previously, HELB was only financing students enrolled in public universities (Lubanga, 2014; Ministry of Education Sector Working Group, 2019; Mutua, 2019; Wachira, 2019). Other policy initiatives have focused on financing and resolving the challenges that are related to the financing of TVET. For example, the government established the TVET funding board to ensure more regular and systematic funding of the training institutions (Akala & Changilwa, 2018).

Challenges to TVET in Kenya

Despite the many initiatives noted above, TVET in Kenya faces multiple challenges. A key challenge has been TVET's lack of esteem and the public's negative view towards it. Elsewhere, I traced these challenges to the discriminatory approaches employed by

the colonial government towards the education of Africans and the use of schooling as a ticket to well-paying jobs (Njenga, 2020b).

During the colonial period, the British colonial government was reluctant to offer liberal and general education to Kenyans of African descent. Indeed, the colonial government frustrated efforts by Africans to expand access to liberal education. Guided by racist and colonialist ideas, the colonial government preferred simple technical education focusing on gardening and simple practical skills for Africans. Because Africans were seen and treated as a source of manual labour for the colonialists, education leading to better paying work, such clerkship, was instead offered to Asians. Understandably, Africans viewed technical education as education for servitude, were critical of it and generally rejected it. Rejection of technical education was further reinforced by observations that Africans who were lucky to receive general education could easily find well-paying jobs. Moreover, in post-independence and modern-day Kenya, TVET has often been treated as the option for those who fail to make it to the university. Compounding this challenge has been the terminal nature of vocational education, where certificates and diplomas in TVET could not be used to access higher levels of education. Technical education thus came to be seen as some form of substitute education for those not bright enough to follow the general academic track. TVET has thus historically suffered low esteem (Maxon & Ofcansky, 2014; Njenga, 2020b; Sifuna, 2020; Sifuna & Shiundu, 1995).

Other challenges limit access to and the quality of TVET. Some scholars observe that while enrolments have increased, the number of institutions offering vocational education has not had a commensurate increase, both in size and number. There is thus the risk of over stretched facilities and overburdened TVET teachers. Limited quality has also been attributed to shortages in the number of teachers with adequate professional competencies and a TVET teacher training curriculum that has not been modernized (Akala & Changilwa, 2018; Oketch & Peliwe, 2017; Sifuna, 2020).

4.3 Vocational teachers in Kenya

TVET teachers play an important role in the provision of formal TVET in Kenya. Those working in Vocational Training Centres are often referred to as instructors, while those working in the Technical and Vocational Colleges and National Polytechnics are

referred to as trainers or lecturers. In general, TVET teachers are responsible for providing theoretical and practical instruction in their trade areas.

Since Public Technical and Vocational Colleges (TVCs) and National Polytechnics were established by the government, the government is responsible for hiring and managing trainers working in these institutions. Previously, such trainers were recruited and managed by the Teacher Service Commission (TSC), an agency under the ministry of education responsible for staffing and managing government employed teachers. However, it has always been claimed that TSC has better competence in managing primary and secondary school teachers. In the year 2018, a total of 3,780 TVET teachers were thus transferred from the Teacher Service Commission to the Public Service Commission (the government agency responsible for recruiting and managing the staffing of civil servants i.e., central government employees). The transfer adopted special terms of reference to address the needs of TVET trainers. An additional 1,000 trainers have since been recruited. However, it is estimated that an additional 4,000 trainers are needed (Masese, 2020; Ministry of Education Sector Working Group, 2019). At the same time the Technical and Vocational Education and Training Authority, a state agency responsible for regulating TVET in Kenya, started accrediting TVET trainers (Langat, 2019).

Ideally, all TVET teachers in Kenya should have received some form of teacher training in addition to formal training in their trade areas before being employed as teachers. The educational qualifications of TVET teachers depend on the level at which they teach. In addition to a teacher training diploma, instructors working in Vocational Training Centres (VTCs) need a minimum of diploma or craft certificate in their trade area, while trainers working in Technical and Vocational Colleges (TVCs) require a minimum of a higher national diploma or a Bachelor's degree (UNESCO-UNEVOC, 2018).

TVET teachers may receive TVET teacher training leading to the award of a teaching diploma at the Kenya School of Technical and Vocational Education and Training (KSTVET)[7], or training leading to a Bachelor of Education degree at Moi University,

[7] KSTVET was established in 1978 as the Kenya Technical Teachers College (KTTC) to provide vocational training and train vocational teachers. In June 2022, KTTC was renamed KSTVET and given an expanded mandate to provide pre-service and in-service professional development to TVET trainers and other practitioners in TVET (The Kenya School of Technical and Vocational Education Training Order, 2022)

and since 2011, at the University of Eldoret. Universities in Kenya generally follow an integrated or concurrent model for the pre-service training of teachers. KSTVET adopts a consecutive model, i.e., teacher trainees are admitted for the teaching diploma course after they have completed training and received a diploma certificate in a relevant subject area. However, prior technical work experience is neither a requirement to be admitted for teacher training nor a condition for employment as a TVET teacher (Akala & Changilwa, 2018; Ferej et al., 2012; Ministry of Education - Directorate of Technical Education, 2020; Ronoh et al., 2013; UNESCO-UNEVOC, 2018).

Status of TVET teachers in Kenya

Despite the availability of TVET teacher training, not all teachers have received pedagogical training and not all trainers have the requisite educational qualifications. Kariuki's (2013) empirical study on the factors that influence technician training and employability in Kenya revealed that a third of the trainers in Meru TTI and Thika TTI, two of the largest TTIs in Kenya, were untrained in teaching pedagogy. Further, a large number of trainers hold diploma qualifications while teaching diploma students, which puts into question the professional and technical competencies of the teachers to handle their students and the curriculum they are expected to teach. In recognition of the large number of teachers without sufficient technical and pedagogical training, the government ordered more than 3,000 TVET teachers to seek pedagogical training (Oduor, 2021). This situation resulted from an earlier decision by the government to relax the requirement that TVET teachers must have pedagogical training before they are employed.

While the majority of TVET teachers in Kenya have received teacher training, many TVET teachers in Kenya lack adequate skills, exposure to industry, and experience with modern technology (Ferej et al., 2012; Institute of Economic Affairs, 2018; Sang et al., 2012; Sifuna, 2020). As a reflection of the persistence of the issue, similar observations were made in 1999 by the Commission of Inquiry into the Education System of Kenya (GoK, 1999). The commission noted TVET teacher training in Kenya fails to provide sufficient practical experiences in the trade areas that the teachers are later expected to teach. Moreover, owing to inadequate industrial experience TVET teachers in Kenya lack sufficient technical skills and exposure to industry. Accordingly, the commission

recommended continuing professional development of TVET teachers to deal with the identified deficiencies.

The lack of adequate professional competencies has been attributed to insufficient pre-service training for TVET teachers. Pre-service teacher education for both general education teachers and TVET teachers in Kenya is seen as overly focused on subject content knowledge with limited focus on professional practice and especially classroom practice and teaching methods (Bunyi et al., 2013; Ferej et al., 2012; Gathara, 2010; Kitainge, 2004; Lowe & Prout, 2018). TVET teacher training in Kenya suffers a further limitation in that TVET teacher trainees do not receive adequate training in the practical skills that TVET teachers are later expected to teach (Sifuna, 2020).

Empirical evidence supports these assertions. In a study on the preparation of graduate automotive teachers at the university of Eldoret, Ronoh et al. (2013) found evidence of mismatches with regard to the courses and topics the teacher trainees were trained on and what they were expected to teach. From their comparison of the university curriculum and the diploma curriculum in automotive engineering, the researchers found that teacher trainees either received training on multiple courses and topics that they would never teach or never received training to topics that they were expected to teach.

The above challenges are further compounded by the fact that many of TVET teachers in Kenya have been unable to engage in CPD to develop and improve their professional competencies (Akala & Changilwa, 2018; Ferej et al., 2012; Oketch & Peliwe, 2017; Sifuna, 2020). In their study, Lowe & Prout (2018) found that teacher in-service programmes in Kenya have been characterized as bureaucratic, under-resourced and poorly targeted. In-service teacher CPD programs have been criticised for over-reliance on a training model where an expert provides training based on an externally determined agenda. Teacher CPD is thus seen as responding to the needs of administrators who develop the training programs rather than on the actual learning needs of teachers. Teacher CPD programs have also tended to rely on the cascade model to reach a large number of teachers within a short period of time. However, the model often fails to be collaborative and to decontextualize the content being learnt in addition to lowering the quality of information passed down from one level to the next. These

challenges render many of the externally organized CPD programs ineffective (Bett, 2016).

Although the government and donor agencies sometimes provide short in-service training programs, systematic and large-scale provision of TVET teacher CPD lacks in Kenya. TVET teachers are therefore largely responsible for their own professional development, and some teachers pro-actively self-finance their CPD with the hope of better placement, (Bett, 2016; Lowe & Prout, 2018; UNESCO-UNEVOC, 2018).

While the conditions highlighted above demonstrate the need for systematic provision of TVET teacher CPD in Kenya, it is also clear that TVET teachers in Kenya have a degree of access to CPD and engage on CPD on their own. However, the exact nature of such CPD practices remains unclear. In particular, it remains unclear what content TVET teachers learn in their CPD, the effectiveness of their CPD practices and the outcomes of their CPD practices in terms of teaching practices.

A need thus exists to improve TVET teacher CPD in Kenya by refocusing CPD programs to the needs of TVET teachers and developing policies that can stimulate and sustain effective TVET teacher CPD. Refocusing CPD programmes and attendant policies however demands accurate knowledge of teacher CPD and practices. Unfortunately, such knowledge remains unavailable because TVET teacher CPD practices remain under researched in Kenya.

4.4 Chapter summary

This chapter has presented TVET and TVET teaching in Kenya as the more concrete context of the study. The chapter has reviewed the system of education in Kenya and the place of TVET within it. The current state of education in Kenya was highlighted, together with a look at how TVET teachers in Kenya are prepared, the challenges they face in accessing CPD, and resulting need for policy-based solutions to these challenges. Specifically, it was noted that improving CPD programs to respond to the needs of TVET teachers and developing policies that can stimulate and sustain effective TVET teacher CPD has been hampered by the lack of data and research insights into the CPD practices of TVET teachers in Kenya.

Chapter 5 Philosophical and Methodological Considerations

This chapter discusses the ontology and epistemology that guided the study as well as the methodology used. It starts by highlighting the view of reality that guided the study followed by a short overview of the related conception of knowledge. Based on these the chapter then compares qualitative and quantitative research methodologies and justifies the use of a mixed methods approach. Having identified the research methodology to use it discusses the research methods that were used.

5.1 Introduction

This study sought to investigate TVET teacher CPD practices in Kenya and on the basis of the investigation, propose policies to support the professional development of TVET teachers. In considering this type of work, Fenstermacher (1994) observed that educational policies are often made on the basis of research. He argued that to ensure that the research guiding the development of educational policies leads to valid propositions about how to improve education, it is critical that researchers critically evaluate their epistemologies. Knox (2003) continues to offer that to avoid ontological and epistemological challenges, researchers must be aware of, and make explicit, the ontologies and epistemologies guiding their research work. By being explicit with their ontology and epistemology, the assumptions about reality and knowledge that underlie a research study are made clear. The clarity renders the choice of methodology apparent and enables its justification. Further, the clarity helps prevent epistemological and ontological conflicts (Knox, 2003). Given the objectives of the study, it was therefore necessary to adopt a philosophical perspective that is both valid and enables creative critique of the existing practices. Following the advice of Fenstermacher (1994) and Knox (2003) this chapter reviews and sets forth the ontology and epistemology guiding the study before presenting a philosophical justification for the methodology adopted for the study.

5.2 Critical realism

This study followed a critical realist view of reality. Critical Realism is a depth realist philosophy that argues that what is observed is emergent and is produced by underlying process (Collier, 2013; Steinmetz, 2005). Critical Realism assumes that reality is multi-layered and that within the layers of reality are open systems within which multiple

mechanisms act conjointly to determine events and their outcomes. Overlapping systems thus act conjointly to cause outcomes that a single isolated mechanism cannot produce. Processes within the systems and their underlying conditions however have to be uncovered through theory construction and testing. Further the processes are not necessarily immutable and may be changed. That is, by changing the processes and their conditions, better outcomes may be produced. Critical Realism therefore enables depth-based explanations that may be counter-phenomenal. By holding that process are not necessarily immutable and what is produced maybe due to malfunctions in the systems and their process, explanations of what is observed can be critical and therefore corrective. Critical realism is thus characterized by the acceptance of complexity (i.e., emergence of complex structures and processes from underlying structures and processes) and a normative stance (i.e., a commitment to improving "what is" based on a detailed understanding of "what is") (Collier, 2013; Steinmetz, 2005).

Apart from accepting complexity and adopting a normative stance, Critical Realism has a broad view of what constitutes reality and avoids limiting its concept of what is real. Instead, Critical Realism adopts what Collier calls a "maximalist ontology" that posits the real existence of the material, mind and ideas, discourses, structures, as well as individuals and societies. Aspects such as human desires and motivations are taken as real and can therefore can be investigated and used to explain social conditions (Collier, 2013, p. 334).

Social systems and practices are viewed as emergent from human interactions. Since human interactions are embedded in the physical world and are affected past interactions, the social world cannot be understood in isolation of its history and the physical and material world from which it has emerged (Collier, 2013). The epistemological and methodological implication of this view of reality is that in the social world, seeking definite causes and effects may never work. In the alternative, providing detailed descriptions of what took place and the circumstances within which it took place may help us understand the world better. This conception of reality and knowledge enables a creative critique of exiting practices, without isolating them from the conditions that have led to them (Berliner, 2002; Collier, 2013; Olsen, 2008).

In line with the view that certain facts about reality are not immediately apparent, it is taken that knowledge is not given. Instead, a significant component of knowledge is

created based on the observations we make about our world. A constructivist view of knowledge thus guides this study, with knowledge consisting of facts that emerge from our observations of the world and our interpretations of those observations.

5.3 Research methodology

Given the emergent and complex nature of the social world identified above, a wide range of approaches have been developed to study it. Literature on research methodologies often categorizes these approaches as either quantitative or qualitative. As the name suggests, quantitative approaches attempt to measure and numerically quantify aspects of the social world. Quantitative approaches further use numerical methods to draw conclusions that can be supported by the numerical data. Qualitative approaches on the other hand seek to use non-numerical data, for example narratives and descriptions of qualities, to arrive at a better understanding of the social world. A third category of approaches attempts to mix the two approaches (Bryman, 1984; Gibbs, 2014; Norwich, 2020). Gibbs (2014) notes that quantitative approaches are often loosely interpreted as positivist, qualitative approaches as interpretive and mixed methods as pragmatic.

Bryman (1984, 2012) noted that quantitative approaches are characterized by an emphasis on operational definitions, objectivity, reliability and causality which are common in positivism. This leads to the assumption that quantitative approaches are based on positivist ontology and epistemology. Thus, within the positivist approach, the method of choice for collecting social data is the questionnaire survey because it rends itself to easy adaptation to meet these concerns. For example, survey items in a survey can be clearly operationalized. Objectivity appears guaranteed by the distance between the researcher and the participant and the use of external checks on the questionnaire. By using the questionnaire repeatedly on the same participants and with different participants, reliability and validity can be checked while using it in a different context enables replication. The numerical nature of the data obtained from a questionnaire-based survey allows for numerical based hypotheses testing.

However, quantitative approaches, such as those employing surveys are criticized as being incapable of generating the richness in description and understanding of context produced by qualitative methods. This weakness in quantitative approaches is attributed

to the focus on a limited set of causal relationships identified beforehand where such variables may in fact appear arbitrary and lack a connection or meaning to the social actors they intend to represent (Marsh, 1984).

Qualitative approaches on the other hand appear to agree with interpretive and non-positivist epistemology and ontology. Methodologies frequently associated with qualitative approaches include ethnographic, hermeneutic and phenomenological methodologies. The data collection methods frequently used are field surveys, unstructured interviews, participant observation, fieldwork, document reviews etc. (Denzin & Lincoln, 2006). These are supposed to yield "rich data" that is a consequent of getting close to the social actor and seeing the world from his point of view. Further the qualitative methodologies are assumed to lead to an awareness of what could not have been anticipated about the social actors beforehand. It is therefore assumed that the approaches are inductive and constructive rather than deductive and positivist (Bryman, 1984; Norwich, 2020).

While the above contrast seems to suggest deep layered ontological and epistemological differences between qualitative and quantitative approaches there are strong grounds to reject the notion that the two methods are epistemically and ontologically different. The National Research Council (2002), Becker (1996) and Norwich (2020) strongly argue that the epistemology that underlies the two approaches is similar and that in fact the distinction between them is superficial. It is thus argued that while ontological and epistemological beliefs are closely related and while certain perspectives may frequently adopt particular methodologies, there is no inherent link between methodologies and perspectives (Knox, 2003).

Becker (1996) continues to argue that similarities the approaches are more important than their apparent differences. Whilst contending that it is almost unavoidable to compare qualitative approaches such as those using ethnographic field-work to quantitative approaches such as those using structured questionnaires, Becker argues that owing to their similar aims and complementary nature, the approaches are not different. Both approaches have a similar aim of describing social reality and establishing how society works.

Becker (1996) notes that, quantitative approaches seek to develop law like statements about aspects of reality and therefore tend to use a limited set of variables to describe and explain. On the other hand, qualitative approaches are open to using many more variables constructed from observed events. This is because qualitative approaches have the goal of developing a description of what produces the observed events and their effects using a network of relationships that need not be strictly proved. But this difference is technical rather than epistemic, for descriptions can use laws derived elsewhere and laws can be justified using descriptions developed elsewhere. Essentially, the approaches are complementary since they depend on each other, the laws cannot be made without reference to specific cases to show that the laws work, while the cases and context cannot be described without reference to the general.

An alternative distinction is made that qualitative methodology is exploratory owing to its unstructured nature and lack of specified hypotheses. On the other hand, quantitative approaches are supposedly confirmatory given their use of quantitative hypothesis testing. Bryman (1984) argues that if this is true, then the two approaches have no real epistemological difference. For how can they address radically different epistemological issues yet feed each other by exploring and confirming what the other has found?

5.4 Mixed methods

Given that no inherent epistemic or ontological differences have been identified between qualitative and quantitative approaches, it is therefore logical to bring the two approaches together. Mixing of approaches is premised on the pragmatic view that no one approach can adequately capture all the elements of reality. Mixing is thus a form of triangulation, wherein, different sources of information, methods of data collection and analysis are used to arrive to a version of the truth that is closest to reality (truth is here implicitly defined as concurrence with reality). In mixing the approaches, it implied that the research design adopted is related to the research question with the aim of arriving at a good answer without any prior commitment to a particular paradigm (Bryman, 1984; Gibbs, 2014; Norwich, 2020).

Essentially, it is assumed that there is nothing inherently paradigmatic with respect to the methods used to correct data; instead paradigmatic differences are reflected in the analysis and interpretation of the data obtained (Knox, 2003; Marsh, 1984). Thus, non-

positivists may use questionnaire surveys just as positivist may use unstructured interviews. Given the complexity of social reality, mixing is thus a technical solution to the problem of studying social reality (Bryman, 1984; National Research Council, 2002).

The mixed methods approach is however more than a simple combination of quantitative and qualitative methods (Creswell, 2014). Their careful combination enables the description of the world with the precision that numbers and quantification offers while providing room for the detailed description and interpretation of the world (Brown, 1992; Gore, 2017). According to Burbules, Bridges, Griffiths, & Smeyers (2015) the mixed methods approach views qualitative and quantitative approaches as complementary to each other. Each approach considers what the other ignores. By bringing the two methods together, each approach enriches the evidence and understanding derived from the other. Thus, by combining the two approaches, a fuller and more realistic understanding of the problem under study is obtained. This study takes this view of mixing approaches.

An alternative view of mixed methods, borrowed from Dussel's view of comparative studies, could be adopted. Dussel (2015) argues that by bringing out differences, comparison raises new questions while helping us to learn what we could otherwise not learnt by looking at only one case. As such mixed methods research could take the form of a comparative study, where data obtained from different sources and using different methods are compared to produce a deeper understanding that could otherwise not be attained. Thus, the data are not just complementary in the sense of filling gaps left by the other, but their comparison brings out differences and enables alternative ways of seeing the data. Both of these views of mixed methods were adopted in this study.

5.4.1 Description of the survey method

Marsh (1984) further argues that the characterizations of the approaches do not necessary apply to the methods used to collect data, and in particular to the survey method. She argues that surveys can take a variety of forms and are not limited to questionnaire surveys. Thus, while the survey may serve the needs of those working with a positivist conception of reality and knowledge, as a method of collecting and organizing data, it can be used by those who hold different conceptions of reality and

knowledge. Marsh thus argues there is nothing inherently positivistic, phenomenological or interpretivist with the survey.

Becker (1996) describes the survey method as a variant of the experimental approach in which the researcher looks for numerical differences between groups of people who differ in in some important and interesting way on some characteristic. Marsh (1984) adopts a much broader conception of the survey method, wherein the survey is not limited to numerical data. She defines a survey as any enquiry that collects pieces of information about the attributes of individual cases from a number of different cases with the aim of analysing the relationships between the attributes. The information is then organized as a matrix of cases and their attributes. Each attribute is defined such that variations across the cases are meaningful. Each possible variation is then provided with a unique and unambiguous code that reflects the specific state or condition of the case which allows for an exploration of the underlying theoretical expectations of that state, for example behaviour, beliefs, social outcomes, etc. Each possible value of the attribute is thus in essence a code with an underlying meaning that the variation carries or implies, for example what kind of behaviour or social outcomes to expect. As an example, the attribute gender has variable codes male or female and the code female has meaning and implications that are different from those of being male, for example it may connote responsibility for caring for the young and therefor lacking time for professional development while the code male may not carry this connotation. Similarly, having only two gender codes reflects the theoretical view of the researcher, for example that other gender states do not exist, or that they do not significantly influence the behaviour or social outcomes under study (Marsh, 1984).

Based on the above conceptualization of a survey, Marsh (1984) notes that with a survey, analysis then is a systematic analysis of the cases and their values to establish if there is systematic variation in the "dependent variable" with a corresponding variation in the "independent variable". The argument can then be made that, based on the theory guiding the study, and in the absence of a reason to expect otherwise, the independent variable causes a corresponding change in the dependent variable. This may not definitively prove causation, but it would provide a limited basis for expecting the existence of a strong relationship. On the other hand, if no relationship is found, one

could refute the theory, although again not conclusively, since an unknown suppressor variable may exist that hides the relationship (Marsh, 1984).

While the survey method is widely used, the method is also criticised on both positivist and non-positivist grounds. Marsh (1984) reviewed these criticisms and answered to them, noting that many of the criticisms point to technical problems that are solvable rather than raise fundamental philosophical issues inherent only in surveys. When the criticisms do point to philosophical issues, the issues raised are not unique to surveys but are fundamental philosophical issues that cut across all data collection methods in the social sciences. Olsen (2008) holds a similar position and argues that while surveys have their limitations (like all other methods) it is possible to use them productively if one is actively aware of their limitations. On these grounds, this study used the survey method as part of the research design.

The survey took the form of the widely used self-assessment of past learning activities and self-evaluation of competence and learning needs (Collins et al., 2014; OECD, 2014, 2018; Rojewski et al., 2021; Saucier & McKim, 2011; Schmid et al., 2021). In some studies, researchers have complemented the self-assessments with interviews to extend and corroborate findings from the self-assessments (Anstey & Clarke, 2010; Naliakamukhale & Hong, 2017). This study similarly complemented and extended the survey with interviews.

Despite the wide use of self-assessments as demonstrated above, the accuracy of self-assessments of competence, knowledge and learning is subject to debate. Some researchers point out that the accuracy and reliability of self-assessments is reduced by desirability bias, responses bias and by subjective interpretation or outright misinterpretations of items (Athanasou, 2005). For those in favour of self-assessments, the method is fast, efficient, and reliable. The method also has the substantive advantage of accessing subjective information about the subjects that outsiders may not be aware of (Allen & van der Velden, 2005). Rothwell & Graber (2010) also view the use of self-assessments as beneficial to respondents because it results in internal reflection and helps the individual become more self-aware.

However, studies reviewing the accuracy and reliability of self-assessment find that self-assessments are relatively accurate if well designed (Freund & Kasten, 2012;

Sitzmann et al., 2010; Zell & Krizan, 2014) and give valuable insights and support formative learning (Athanasou, 2005; van Loon, 2018). van Loon (2018) noted that in contexts where there are no threats, what an adult learner says about themselves and their learning is likely accurate and informative enough. It can therefore be concluded that despite the reservations expressed against surveys and self-assessments, surveys and self-assessments are methodologically sound methods to getting insights into the professional development of teachers.

5.4.2 Description of the interview method

In addition to the survey, the study adopted interviews to extend and corroborate the survey. Woods (2011) defines an interview is a conversation with a purpose; the purpose being to collect detailed information about the experiences of others. According to Roberts et al. (2019), an interview uses every day terms to collect data as a comprehensive summary of specific aspects or events. The use of everyday terms allows the participant to present phenomena as they experience them and to identify the meanings they attach to them. The interviewer thus invites the interviewee to share their knowledge, experiences and held meanings in their own terms, with the role of the interviewer being to help the interviewee to explicate their underlying assumptions about the world and how they approach the world (Roberts et al., 2019). There is an implied recognition that the experiences of the participant are valid and worth listening to.

Lochmiller (2018) and Woods (2011) identify the interview as an overarching term that can be applied to a wide range of different forms of interviewing. One form of interview is the structured interview in which a participant is guided to answer a predetermined set of questions following a strict sequence. Semi-structured interviews are less strict, allowing the participant to direct the interview to topics or issues they feel are relevant. The semi-structured interview is flexible and the participant is encouraged to share their thoughts. Such thoughts or ideas can later be followed up with other participants. Accordingly, the study used semi-structured interviews as part of the research design.

Marsh (1984) argues that questions (both in surveys and interviews) are live communications that communicate the intentions of those who ask to those who are asked. To get the desired response, the question must communicate those intentions

clearly to the respondent. In Marsh's view this is the main practical problem with surveys that request information from individuals irrespective of using a fixed type questionnaire or an interview. The researcher must ensure that her intentions are communicated clearly to the respondent so that the information she receives aligns with her intentions. If the intentions behind the question are clearly communicated to the respondent, the respondent will give a response that aligns to those intentions. This advice was adhered to in the design and implementation of the research instruments.

5.5 Chapter summary

The chapter has outlined the philosophical position guiding the study. Critical Realism was adopted as it enables critical and creative analysis of existing practices. It was also argued that the social world is too complex for one research approach to effectively provide sufficient knowledge about the social world. A review of the quantitative and qualitative research approaches showed that they lack significant epistemic and ontological differences. Instead, the approaches complement each other rather than crash. It is thus tenable to use the two methods concurrently to yield a detailed description and explanation of the social world. Based on the foregoing, and to attain the broad aims of the study, a concurrent mixed methods research design involving a questionnaire survey and semi-structured interviews was therefore adopted. The next chapter discusses the details of how the methods were implemented for the collection and analysis of data.

Chapter 6 Research Design

The fifth chapter concluded with a justification of using a mixed methods approach involving the concurrent use of a questionnaire survey and semi-structured interviews. This sixth chapter discusses the data collection instruments and how they were developed, how participants were selected, and data collected. The chapter concludes with a description of the study participants.

6.1 Introduction

The study sought to obtain a clearer understanding of the Continuing Professional Development practices of TVET teachers in Kenya and use that understanding to propose policies that can stimulate and guide the effective Continuing Professional Development. To attain the objectives of the study, it was necessary to collect empirical data on the various aspects of TVET CPD practices from a broad collection of TVET teachers in Kenya and relate that data to the characteristics of the teachers providing the data. Given that questionnaire surveys can collect large amounts of data from a large number of people in a relatively short time (Creswell, 2014), this aim could be achieved through questionnaire survey on various aspects of TVET teacher CPD in Kenya. A questionnaire survey was thus selected for this purpose.

On the other hand, to understand the practices and their underlying causal factors, it was necessary to obtain detailed descriptions of the context within which the practices take place, the motives guiding the practices, and the held meanings guiding the practices, including beliefs about possible courses of action and their likely outcomes. Given that semi-structured interviews allow for detailed descriptions of practices, their underlying motives beliefs as well as the exploration of the multiple factors that influence beliefs, choices and practices (Creswell, 2014), this aim could be achieved through semi-structured interviews. Semi-structured interviews were therefore selected for this purpose.

A mixed method research design involving semi-structured interviews and a questionnaire survey was thus adopted. Both methods were thus chosen to enable a detailed yet broad description of TVET teacher CPD practices. Further justifying the research design was the view that qualitative and quantitative methods do not crash but

rather complement each other. The rest of the chapter presents the specifics of how the two methods were implemented to collect and analyse data.

6.2 Data Collection instruments

After addressing the philosophical and practical problems relating to the use of the survey, the data collection instrument in the form of a questionnaire was developed. In line with the theoretical framework, the questionnaire collected data on aims and motives for participating in CPD, the content learnt, and the learning methods used. To investigate the role of context, the questionnaire collected data on the costs and challenges teachers face and how they resolve the challenges they face, the benefits and outcomes from CPD, and the support that teachers get in their CPD. Respondents were asked to provide personal details i.e., gender, age, marital status and family size and professional details (number of years worked as a teacher, job group, teaching department, non-teaching responsibilities, entry qualifications, and current qualifications).

The reviewed literature showed that the CPD development practices of vocational teachers mirror those of general education teachers but with certain variations. Accordingly, rather than duplicate past efforts and develop an entirely new instrument that would have been similar to existing instruments, the questionnaire items were adopted from those used in TALIS 2013 and TALIS 2018 to explore the CPD practices of teachers (OECD, 2014, 2018). Moreover, this was in line with past studies that adopted the TALIS items to examine and compare the CPD practices of vocational teachers in nine countries in Western Balkans and Turkey (Stanley, 2021) and Hungary (Bükki, 2022). This was also in line with the approach used by similar studies in the past, e.g. Andersson & Köpsén (2018).

To account for the variations in TVET teacher CPD practices, some items specific to TVET teachers and the general objectives of the study were added. This included a section on the use and preferences for Lecturer Industrial Attachment and questions on policy recommendations by the teachers. All the questionnaire items in the questionnaire used a Likert-type scale. Below is a detailed description of the questionnaire items.

6.2.1 Questionnaire items

To assess the professional development needs of TVET teachers, survey respondents were also asked to self-evaluate and indicate how confident they feel with respect to their professional knowledge and consequently what professional knowledge they would like to learn. The categories of professional knowledge as developed by (Shulman, 1986) and elaborated by others (for example, Neumann, Kind, & Harms (2019) and (Morine-Dershimer & Kent (1999)) were used. The items used in the questionnaire mirror the items measuring the need for professional development as used in the 2013 and 2018 TALIS surveys (OECD, 2014, 2018).

To identify the CPD practices TVET teachers frequently use, respondents were asked to indicate how frequently they had participated in various CPD activities. For purposes of analysis, the CPD activities used in the questionnaire were categorized into four categories i.e., formal, collaborative, self-paced, and practiced based[8]. These are described in the list below.

a. Formal CPD activities referred to structured and formally organized learning activities that are often facilitated by an expert. Examples include activities such as workshops and seminars, short and long courses offered by colleges and universities, and educational conferences.
b. Collaborative CPD activities referred to CPD activities that rely on teamwork and peer-learning. Examples of collaborative CPD activities include co-teaching and lesson observation, mentoring and coaching other teachers, and participation in teacher clubs.

[8] This categorization mirrors the categorizations of teacher professional learning activities used elsewhere: e.g. Desimone (2009), Fadzil et al. (2011), Fraser et al. (2007), Kennedy (2014) and OECD (2013a) with slight variations. I chose a classification based on "learning from and with who": (a) Learning from and with experts, i.e., formal CPD activities; (b) Learning from and with others i.e., collaborative learning; (c) Learning from activities and reflection, i.e., embedded learning activities; and (d) Learning from "information search" i.e., self-paced learning activities.

Zhou et al. (2022) uses a similar classification, with a slight variation: (a) Learning from and with experts, i.e., pre-defined/formal CPD activities; (b) Learning from and with others i.e., collaborative learning; and (c) Learning from activities and reflection, self-directed learning activities that take place within the school or in industry.

Lecat et al. (2019) used a different categorization of learning activities that used the categories: learning from others; learning from non-interpersonal sources; and learning from one self. This categorization scheme appears to be based on "learning from whom".

c. Embedded and practice based CPD activities relate to work activities that are characterized by a high degree of learning and require teachers to step out of their normal routine and relook at content, practices and outcomes. These include participating in designing content and learning materials, curriculum development, and developing and marking national examinations. Other embedded activities include participating in research activities, writing reflections about practices and their outcomes, and participating in Lecturer Industrial Attachment (i.e. work placements for the vocational teachers in industries or other workplaces).
d. Self-paced CPD activities referred to learning activities undertaken by and directed by the individual teacher and include studying professional literature, watching videos and online content relating to teaching content and teaching methods, and discussions with colleagues to solve practice challenges.

Respondents were also asked to indicate the sources from where they obtain information from and how helpful they find the sources to be. For lecturer industrial attachment, respondents are asked to indicate their preferences with regard to length and frequency. An exploratory question was added to assess how teachers incorporate what they learn in their teaching practices.

The study also sought to assess the effectiveness of the CPD practices. To assess the effectiveness of the CPD activities, respondents were asked to evaluate how well their past CPD activities met the criteria for effectiveness identified by Desimone (2009). A similar approach was used during the TALIS 2013 and TALIS 2018 surveys (OECD, 2014, 2018). The respondents indicated if their past professional activities had been organized to include opportunities for active learning with other teachers and if the activities took place over a sufficient duration of time spread out over several weeks or months. Respondents also indicated if the content covered was relevant to their practice and had a coherent structure.

Respondents were also invited to report on the challenges they face and how they have solved them in the past. The possible challenges are similar to those used in the adult education survey as reported by Cedefop (2015a) and in the TALIS 2013 and 2018 surveys (OECD, 2014, 2018). These include lack of time, cost, difficulty in finding desired programmes, and lack of employer support among other. Costs could be either

direct or indirect. The full nature of motivations and costs and challenges to learning was also explored using interviews where respondents can describe these factors in greater detail.

To explore the role of the school in influencing professional learning, respondents were invited to report on how they support others to learn and how supportive they perceive the institute to be. Teachers with non-teaching responsibilities were also invited to report on how non-teaching responsibilities hinder or support their professional learning. Two additional questions were asked teachers how the examination system influences their learning and teaching practices.

After identifying the questionnaire items from literature and phrasing them, the items were coded on the Qualtrics Survey platform before it was converted into a text document. The platform was chosen because it provides a convenient means of coding the items and analysing the questionnaire as it evolved. This also presented an opportunity to evaluate the suitability of carrying out the questionnaire online. A group of five non-practicing TVET teachers were requested to fill the questionnaire and to give their views about the questionnaire. Their feedback was used to fine tune the instrument.

6.2.2 Oral interview questions

The semi-structured interviews explored the meanings that TVET teachers hold about teaching and teacher CPD and what implications their held meanings have on working as a TVET teacher and on TVET teacher CPD. This enabled the discovery of what teachers think CPD is and its value to them. The interviews also focused on prior CPD experiences. Specifically, the interviews explored the reasons for participating in CPD (i.e., reasons, motives and expected outcomes) and obtained outcomes. The comparison was expected identify the frustrations teachers face and how these shape their later choices. The interviews also focused on how teachers learn (i.e., learning strategies adopted) and on why they choose those strategies (i.e., the rationale for their learning methods). Thirdly, the interviews focused on the costs and challenges teachers face. By exploring what challenges and limitations teachers face, the teachers explained the choices they have made in pursuing their professional development. Finally, the

interviews invited the teachers to propose policies that can better support them in their CPD. The recommendations gave an insight into what policies are acceptable.

6.2.3 Piloting of the questionnaire and interview schedule

After preparing the data collection instruments based on the objectives of the study as discussed above, an expert was invited to assess their face validity. Thereafter, the instruments were then piloted. The pilot study was carried out between August and September 2019 at three Technical Training Institutes (TTIs) in the Nairobi Metropolitan Area. These were, Thika Technical Training Institute in the Industrial Town of Thika, Nairobi Technical Training Institute in the capital city, and Masai Technical Training Institute in the more rural area of Metropolitan. Given their profile, it was expected that the institutes would give a representative view of the metropolitan and by extension the country.

Together with three interviews from the three TVCs, a total of 40 validly filled questionnaires were obtained: twelve were from Thika TTI, eleven from Nairobi TTI and fourteen from Masai TTI. To evaluate the suitability of using the questionnaire online, three respondents from different institutions were asked to fill the questionnaire. The pilot survey data was then coded and entered into an excel file and later imported for analysis onto SPSS version 24. Interview data was transcribed using the oTranscribe platform. Owing to the small number of oral interviews done during the pilot study, thematic analysis was not done.

The main aim of the pilot study was to improve the data collection instruments. During the pilot survey, respondents were encouraged to give their views of the questionnaire. Several respondents pointed to items they felt were ambiguous which were then reworded for clarity. The pilot survey also revealed that several items that requested respondents to provide written answers were not responded to. These items were consequently dropped from the questionnaire. The pilot interviews were similarly useful in guiding the further development of the interview schedule. Some of the interview questions was re-formatted and grouped to explore similar themes. The final instruments are shown in Appendixes 1 and 2. Since the respondent were found to respond effectively to the data collections instruments without experiencing respondent fatigue, the length of the instruments was deemed appropriate for the study.

6.3 Analysis of the data

Survey data was analysed using both descriptive and inferential statistics. Descriptive analysis focused on presenting an aggregate description of the respondents, their CPD practices, motivations, and costs and benefits. Inferential analysis focused on relating variables to each other. This included investigating the increases or decreases in participation rates due to variations in the factors. Inferential analysis included the use of cross-tabulation, correlational and regression analysis for associations between respondent characteristics (personal and professional) and their reported practices, motivations, costs and felt benefits. T-test and ANOVA tests were also used to assess differences between means. Additional analysis involved factor analysis and cluster analysis.

While different methods can be used to analyse interview data, Roberts et al. (2019) shows that when presented with textual data, derived in this case from an interview, thematic analysis is an appropriate way to make sense of it and derive meaning from it. Accordingly, and given the purposes of this study, data collected from the interviews was analysed through thematic analysis. Thematic analysis followed the iterative process that involved getting familiar with the data, coding the data, theme identification, and reporting as recommend by Nowell et al. (2017), Roberts et al. (2019), Saldaña (2013), and Woods (2011).

The familiarization began during transcription followed by repeated reading and rereading of the data. After becoming familiar with the data, the data was coded. Coding started with attribute coding for respondent characteristics, followed by structural coding. Structural coding focused on the research question and interview question responded to. The transcripts were then read repeatedly to identify salient points made and from these points, the recurring points were identified and coded using descriptive labels or summary terms. Some to the terms used to code the data had been identified from literature while others were emergent. To enhance consistency in coding the data, an initial code book was developed after coding three interviews. This initial code was then used to guide the coding of the remaining interviews. However, given that developing a complete codebook is time consuming (Roberts et al., 2019) the code book developed for this purpose was a tentative codebook. The coding and theme identification was iterative, leading to a more refined set of codes and themes that were

distinct, coherent and could fully describe the data and enable its interpretation. Overarching themes were labelled, described and related to each other. Given that the study used a mixed methods approach, the identified themes, and their codes were compared with the survey data to form a better understanding of TVET teacher CPD practices in Kenya. The interpretations arrived at were guided by the theoretical framework of the study.

6.4 Identification and selection of participants

6.4.1 Unit of analysis

The unit of analysis for the study in the study were TVET teacher working in a public Technical Training Institution in Kenya. A TVET teacher was defined as one whose primary duty in a technical training institute is student instruction and student assessment. Such instruction may be through the delivery of lesson-based instruction or via practical demonstrations or guiding students in their practical lessons. This is the definition adopted for the TALIS teacher survey by OECD (2013) which includes teachers in technical and vocational education. In his analysis of the professional development of TVET teachers in Italy, Serafini (2018) adopted the same definition.

Workers who offer pedagogical support such as workshop and laboratory technicians are not included in this definition of a teacher. While such workers support instruction, they are rarely responsible for student learning outcomes and are not subject to the professional and career guidelines that TVET teachers are subject to. Including them in the analysis could potentially limit the validity of the results.

Non-teaching roles such as heading an institute were regarded as additional characteristics of teachers which potentially influence their CPD practices. In Kenya, principals of TVET institutes are teachers who have been promoted into those positions and occasionally continue teaching. Other non-teaching responsibilities that TVET teachers in Kenya may hold include responsibility for student welfare, e.g., dean of students, and responsibility for academic programs, e.g., head of a teaching department.

6.4.2 Study location

In line with the focus of the study, the study population were TVET teachers in Technical and Vocational Colleges (TVCs) in Kenya. However, due to the geographical expanse of Kenya, and the large size of the study population, Nairobi Metropolitan Area

was chosen as the study location. The study location was chosen due to its diversity and it was expected that the area would be a rich source of information crucial to understanding the country as a whole. The Nairobi metropolitan area is Kenya's principal economic and culture centre generating 60 per cent of Kenya's GDP and home to approximately 15 per cent of the country's population (Mundia, 2017). The area consists of five of the 47 counties in Kenya's devolved system of governance. The five counties are, Kiambu County, Kajiado County, Nairobi City County, Machakos County and Murang'a County. Under the 2010 constitution, counties are the main political and administrative units of the country.

6.4.3 Sampling

To select participants, simple stratified sampling was carried out. Stratified sampling is frequently used in sample surveys wherein a population is split into distinct groups. Each group is then independently sampled (Parsons, 2017). For this study, the grouping was by county and from each county, a Technical and Vocational College (TVC) was chosen. Participants were selected by simple random sampling from each of the selected TVCs. In line with the recommendations by Parsons, it was deemed acceptable to use simple random sampling in the TVCs because there was no reason to assume that teachers in the TVCs are not homogenous. Additionally, it was not possible to access data to develop a more sophisticated sampling plan.

In each county, there are between two and three TVCs and the sampling plan was to pick one TVCs from each county. While Nairobi County has many more TVET institutions, many of them are specialized government training institutions, and they may not be similar to the TVCs found in the other counties (see Appendix 3). Thus, to ensure that findings are comparable, respondents from Nairobi County were selected from TVCs comparable with those found in the other counties in the study area. The list of public vocational training institutions is shown in the Appendix 3.

The appropriate number of participants for the interviews was set following the recommendations of Guest et al. (2006), Morse (2000), and Robinson (2014). Morse and Robinson caution that multiple factors determine the appropriate number of participants in a study involving interviews. These factors include the nature and scope of the study, the quality of data obtained from each participant, and the research design.

Morse argues that when the focus of a study is narrow and with a clear topic, participants are articulate, and able to provide rich data, fewer participants are needed. Morse then suggests six participants when investigating experiences, which is corroborated by Guest, Bunce, & Johnson (2006) who found that the basic elements of meta themes were present from six interviews when they analysed sixty in-depth interviews seeking to find patterns of saturation. They defined saturation as the point at which new information produces little or no change to the code book. Saturation occurred at twelve interviews, hence their suggestion of a sample size of twelve to fourteen participants. They supported their finding using consensus theory, but caution that the recommendation is only applicable to a relatively homogenous population interviewed using similar questions. Both conditions are met in this study.

Noting that the present study had a very specific focus and the participants were relatively well educated and could therefore be articulate, a target sample size of eighteen was set. However, bearing in mind the difficulties associated with collecting data, a minimum sample size of fifteen was set. The criteria guiding the selection of the participants were: (a) participants from six public TVET institutes in the Metropolitan Area, (b) three teachers from each institute, (c) at each institute, a teacher from each career stage (i.e., Early Career Stage, Middle Career Stage and Late Career Stage) and, (d) at each institute, a teacher from each gender. The rationale being that the diversities in gender and age will reflect the diversity of personal and professional factors that likely influence continuing professional development.

With respect to the questionnaire survey, the sample size set was 200 teachers, (i.e., 40 teachers from each of the five TVCs. It was estimated that TVCs have on average 150 teachers, representing a sampling rate of at least 25% of teachers in each TVC which was deemed sufficient.

6.5 Data collection

After ethical permission was obtained from the Ethical Committee of the Faculty of Pedagogy and Psychology at Eotvos Lorand University, a research licence was obtained from Kenya's National Council for Science and Technology, data collection commenced. Data collection for the main study took place between January and February 2021 after the partial lifting of the Covid-19 restrictions in Kenya. Principals of the selected TVCs were approached to allow data collection in their respective TVCs,

and with their help or assistance of a contact teacher, individual teachers were requested to fill in the questionnaires.

Due to access challenges following the Covid-19 pandemic, it was not possible to access any of the TVCs in Machakos County. Accordingly, Machakos County was substituted with Nyeri County, a county neighbouring the metropolitan area, and one of the TVCs in Nyeri County chosen by convenience. In the course of looking for a substitute for a TVC from Machakos County, a second TVC from Nairobi County accepted to participate in the study. In the end, six TVCs took part in the study, two from Nairobi County, and one from each of the other four counties.

With respect to the interviews, after identifying potential participants based on the criteria set, the researcher and the contact teacher approached the potential participants, described the research and requested them to participate. For the teachers who gave consent, an interview appointment most convenient to them was set. The researcher then conducted the interviews privately with each teacher. Interviews lasted for between 60 and 90 minutes. The interviews were recorded electronically and later transcribed with the aid of a standalone transcription software called oTranscribe. Coding and theme identification were aided by ATLAS.ti.

6.6 Research ethics

The study commenced after ethical approval was obtained from the PPK Ethical Committee at ELTE University (permit no. 2019/243) and research licensing by the National Council for Science and Technology in Kenya (NACOSTI Licence No.: BAHAMAS ABS/P/20/7651). The main ethical concerns in the study were informed consent and the privacy of the participants. These were addressed by informing the participants about the aims of the study and getting their fully informed consent, respecting their privacy (for example, interviews were conducted in private, while the survey questionnaires did not collect names or other identifying information. Further, interview participants were requested to identify a room most convenient to them.), secure storage of the data in line with the data protection rules and anonymizing the identity of the participants and the institutions in which they worked. Additionally, to avoid participant fatigue, only the data necessary for answering the research questions was collected

6.7 Characteristics of the participants

Of the issued questionnaires, 178 were returned. However, only 170 were validly filled. With respect to the interviews, nineteen teachers agreed to participate. However, two teachers could later not participate in the interviews due to scheduling challenges. A third teacher did not give consent for electronic recording of her interview. Accordingly, only sixteen interviews could be recorded, transcribed and analysed. Below is a detailed description of the participants from whom valid data was collected.

6.7.1 Interview participants

Interview participants had diverse teaching and non-teaching experience. With respect to career stages, three career stages were defined, Early Career Stage, Middle Career Stage and Late Career Stage. These categories were based on past literature. For example, in their study, Avidov-Ungar & Herscu (2019) categorized teachers as entry-level (0-7 years teaching experience), middle-life (8-23 years) and expert-teachers (24 years or more) while Masuda et al., (2013) categorized teachers as pre-service teachers, beginning teachers (those with between 1 to 5 years of teaching experience), mid-career teachers (6 to 20 years teaching experience), and late career teachers (more than 20 years of teaching experience). For this study, a similar categorical frame was used. Teachers who had worked for less than five years were categorized as Early Career Stage teachers, those who had worked for 6 to 20 years were categorized as Middle Career Stage teachers, and those who had worked for more than 20 years were categorized as Late Career Stage teachers. The Early Career stage was further split into New Teachers, for teachers who had worked for less than two years, and Junior Teachers who had worked for between three and five years. Three of the interview participants were Early Career stage teachers, nine were middle career stage teachers and the rest were late career stage teachers. The distribution of the teachers by the county where the teachers work and career stage is shown in the Table 2.

Table 2: *Career stage by county*

Career Stage by County

		County						
		Nairobi_1	Nairobi_2	Kajiado	Murang'a	Nyeri	Kiambu	Total
Career Stage	Early	1	1	0	0	1	0	3
	Middle	1	1	2	2	1	2	9
	Late	0	0	1	1	1	1	4
	Total	2	2	3	3	3	3	16

With respect to the teaching area, twelve of the teachers taught STEM related disciplines (i.e., Science, Technology, Engineering and Mathematics), while others taught in the business and communications fields. Moreover, seven of the teachers had worked elsewhere before they joined teaching while the rest did not have prior work experience. The distribution of the interview participants by teaching area and prior-work experience is shown in Table 3.

Table 3: *Prior work experience by teaching area*

		Prior Work Experience		
		Yes	None	Total
Teaching Area	Engineering	4	4	8
	ICT	0	1	1
	Medical Science	1	0	1
	Business Studies	0	1	1
	Communication Studies	1	2	3
	Mathematics	1	1	2
	Total	7	9	16

With respect to educational qualifications, one of the participants had a Higher National Diploma, while three had a Bachelor's degree. Five of the participants had enrolled for a Master's degree while six had already obtained their Master's degree. One teacher had a PhD degree. These qualifications were more or less equally split along gender as indicated in Table 4.

Table 4: *Gender by educational qualifications*

		Educational qualifications					
		Higher National Diploma	Bachelor's Degree	Masters (Enrolled)	Master's Degree	PhD	Total
Gender	Male	0	3	2	3		9
	Female	1	0	3	3	0	7
	Total	1	3	5	6	1	16

Eleven of the participants held administrative and non-teaching responsibilities in the institutes. Administrative responsibilities included being a principal, deputy principal, or head of an academic department, while non-administrative responsibilities included responsibility for student guidance and counselling and sports. The non-teaching responsibilities were largely administrative as shown in the Table 5.

Table 5: *Non-Teaching responsibilities of the participants*

Non-Teaching Role	Number	Responsibility
Principal	1	Executive management of the institutes
Deputy Principal	1	
Registrar	2	Student affairs
Dean of Students	1	
Head of Department	3	Academic affairs of departments
Deputy Head of Department	3	

6.7.2 Survey participants

The survey population was equally diverse. With respect to gender, 116 respondents were male and 54 were female, translating to 68% male and 32% female. The sample distribution by gender matched the national distribution of TVET teachers. In August 2020, the Directorate of Technical Education reported that of the 5,622 TVET teachers employed by the Public Service Commission, 65.36% were male while 34.61% were female (MoE-Directorate of Technical Education, 2020). The distribution of the survey respondents thus followed the national distribution, with roughly two thirds of the responses coming from male teachers and a third coming from female teachers. The cross tabulation of the responses by gender and the county where the teachers worked is shown in the Table 6.

Table 6: *Distribution of survey respondents by gender and TVC*

`		Gender		
	TVC	Male	Female	Total
County	Nairobi_1	13	6	19
	Nairobi_2	23	11	34
	Kajiado	21	6	27
	Murang'a	20	12	32
	Nyeri	23	10	33
	Kiambu	16	9	25
	Total	116	54	170

Other attributes of the survey participants are shown in Table 7. By age, 26.5% were below 30 years of age, a third (35.3%) were between 31 and 40 years of age, while

23.5% were between 41 and 50 years of age. The rest, 14.7%, were above 50 years of age. With respect to educational qualifications, majority of the respondents had a Bachelor's degree (57.6%), while a quarter (24.7%) had a Master's degree, 16.5% had a Diploma Certificate issued by a non-university tertiary educational institution, and 1.2% had a PhD degree. The results closely match the national distribution for PSC teachers, where 30% have a diploma and 70% have a bachelor's degree and above (MoE-Directorate of Technical Education, 2020).

Table 7: *General description of the quantitative sample*

Teacher Profile		Sample (N =170)
Teaching Area	STEM	122 (72.4%)
	Non-STEM	47 (27.6%)
Gender	Male	116 (68%)
	Female	54(32%)
Age	Below 30	45 (26.5%)
	31-40	60 (35.3%)
	41-50	40 (23.5%)
	51+	25 (14.7%)
Career stage Teaching experience (Years worked as a teacher)	New (0-2 years)	33 (19%)
	Junior (3-5 years)	40 (23%)
	Middle CS (6-20 years)	63 (37%)
	Late CS (20+ years)	34 (20%)
Initial Teacher Education	ITE before employment	112 (66%)
	ITE after employment	24 (14%)
	No ITE	34 (20%)
Prior work experience	Yes	127 (74%)
	No	43 (26%)
Educational qualifications	Diploma	28 (16.5%)
	Bachelor's degree	98 (57.6%)
	Graduate (2nd or 3rd degree)	44 (25.9%)
Level of students taught	Mainly Diploma level students	37 (22%)
	Both Craft and Diploma students	133 (78%)
Teaching responsibility	No responsibility	50 (30%)
	Non-administrative	75 (44 %)
	Administrative	45 (26%)

By teaching area, teachers in STEM teachers were the majority (72.2 %), while those in business and social studies were 27.6 per cent. Two thirds of the respondents received pre-service teacher training before they were employed to work as teachers, 14% received teacher training after they started working as teachers, and a fifth have not

received formal teacher training. Majority of the respondents had a non-teaching responsibility (70.6%), which was either administrative (26.5%) or non-administrative (44.1%).

With respect to career stages, the Middle Career stage category was the largest with 37% of the respondents followed by the Junior Teachers category with 23.5% of the respondents. The New Teachers and Late Career stage categories were roughly equal at 19.4 % and 20% respectively. When the distribution of the participants across career stages was compared to their distribution across the non-teaching responsibilities held, a statistically significant association was found between career stage and having a non-teaching responsibility, $\chi 2(6) = 39.95$, $p<0.001$. Late Career stage Teachers are more likely to have a non-teaching responsibility. On the other hand, New Teachers frequently do not have any responsibilities. The distribution of non-teaching responsibilities by career stages is shown in Table 8.

Table 8: *Career Stages by Non-teaching roles*

		Career Stages				
		New	Junior	Middle CS	Late CS	Total
Non-teaching roles	None	18	13	15	4	50
	Administrative	0	4	22	19	45
	Other	15	23	26	11	75
	Total	33	40	63	34	170

Thus, 88% of Late Career stage teachers have a non-teaching responsibility, with a majority of Late Career stage teachers having an administrative responsibility. Middle Career Stages are also heavily represented in non-teaching roles, with more than three quarters having a non-teaching responsibility, and more than a third having administrative responsibilities. However, none of the new teachers have an administrative responsibility, and 54.5% do not have any responsibility.

At the time of the research, the TVET teachers were employed and ranked using a letter based ranking scale for the various job groups. A teacher progresses upwards the scale ideally in tandem with increasing professional ability, and therefore higher job-groups are associated with better remuneration and career progress. The entry job-group for teachers with a Diploma Certificate is J and for those with a Bachelor's degree is K. Ideally, after completing the probation period (initially two years, but later reduced to six months) beginning teachers should be automatically promoted to the next job group.

After working for three years, teachers have to apply and pass an interview to qualify for promotion to higher job groups. Promotions to job-groups beyond M are largely dependent on work experience and holding non-teaching responsibilities.

Majority of the respondents were in the entry job groups J and K, i.e., 48.8 per cent of the entire sample. This likely owes to the fact that many teachers work for several years on temporary basis before being formally employed by the government. Only 18.8 per cent of the entire sample was in the middle job groups L and M. Teachers in job-groups N, P and Q formed constituted 17.1 per cent of the sample. A significant 15.3 per cent of the respondents constituted teachers contracted on temporary basis by the institutes to meet staffing gaps. As such, they do not have a specific job-group.

And as can be expected, majority of the Early Career Stage teachers are in the entry job-groups, i.e., 71.2 % of Early Career Stage teachers are in the entry job group. However, nearly 50 per cent of the Middle Career stage teachers are still in the entry job-groups. On the other hand, 62 per cent of Late Career stage teachers are in the more senior job groups (N, P &Q). The distribution of teachers by career stage and job-group is shown in the Figure 3. It is clear that job-group to a large extent depends on the career stage. Despite this, a large number Middle Career Stage teachers are still in the entry job groups J and K. This suggests career stagnation for some teachers. Stagnation and failure to get promoted despite performance and participation in CPD was a frequent complaint during the interviews.

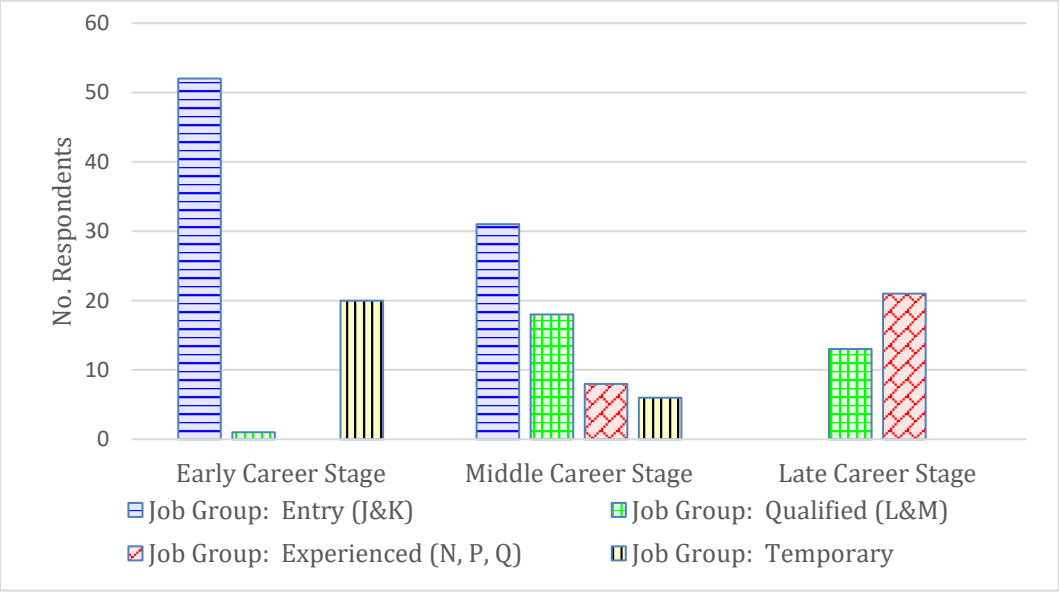


Figure 3: *Career Stages and Job-groups*

6.8 Chapter summary

This study adopted a concurrent mixed methods research design involving a questionnaire survey and semi-structured interviews. This chapter has provided a detailed description of the implementation of the study design. The development of the data collection instruments was discussed together with their field piloting and refinement. The chapter then discussed the study population, the determination of the sample size, and how participants were selected and data collected. The chapter concluded with description of the study respondents.

Chapter 7 Findings

This chapter presents the main findings of the study based on the analysis of the collected data. To structure the presentation, the findings relating to each of the six research questions posed to concretize the study objectives are presented in sequence. In line with the research design presented earlier, i.e., a concurrent mixed methods approach, the analysis of the two data sets (interview data and the survey data) was concurrent and iterative. Accordingly, a similar approach is used to present the key findings from the data. Where appropriate, the presentation of the findings is interspersed with a short discussion of the findings. The chapter concludes with a short summary of the findings.

7.1 Research Question 1: Conceptions of teaching and teacher CPD

The first research question explored the conceptions of teaching and teacher CPD held by TVET teachers in Kenya. Apart from exploring the range of meanings held, analysis also focused on how the held meanings influence TVET teacher CPD practices in Kenya.

7.1.1 What does it mean to be a teacher?

When asked what it means to be a teacher, majority of the participants described teaching in occupational terms. As one teacher put it, *"I am a teacher because that is what I do"*. As an occupation, teaching was the meaningful activity they participated in on a regular basis to make a living. In this case, teaching in TVET is viewed as work that involves providing instruction to students with the aim of developing useful competences in students.

For other teachers, teaching is a calling, in the sense of what one is called to do in service to humanity. Teachers holding this view indicated that they had always felt an inclination to work as teachers and would continue working as teachers despite the challenges that they face such as low pay. For one such teacher, teaching implied self-sacrifice to make others better. This second identity thus sees teaching as a service to society.

Service to society was also described in terms of supporting the generation of new knowledge and solving societal problems. As a service to society, teaching was

described as more than just "teaching" in the sense of providing instruction and presenting information to students; in addition, vocational teachers have the responsibility of using their knowledge to solve some of the problems that society faces:

NbTTi_2:

> *... At our level it is not just about basics ... It is not enough to just go to class and teach ... At the end of the day, we need to come up with things. We need to solve problems.*

From these identities, different goals of teaching could be identified. A frequent statement describing the goal of teaching was to produce positive outcomes in the lives of students. In doing this, TVET teachers seek to develop useful competencies in their students while developing the characters of their students to enable them lead successful lives after school. To achieve these goals TVET teachers work to transfer and impart useful and relevant knowledge in their students. The excerpt below crystallizes these views of teaching:

Interviewer:

> *So, what do you think it means to be a teacher?*

MaTTi_2:

> *To model and help people build their careers, impart knowledge and skills, and change their character.*

With respect to character development, teachers said they achieve this goal by engaging in ethical conduct and modelling the characters and values that are desirable in their students. Such role modelling takes place both inside and outside the classroom:

MaTTi_3:

> *You are always a teacher even when you are not teaching.*

In addition, teachers "talk" to their students so as to instil the right and appropriate values. Thus, one interviewee identified guidance and counselling as a core part of teaching even if one is not specifically trained in Guidance and Counselling:

ThTTi-2:

> *I do a bit of guidance, though I am not so much into it, because I have not studied guidance and counselling, I attend seminars. But every teacher is a guidance counsellor (sic). That is something that should be in all of us.*

Given that students must pass examinations to get certified as competent before starting their careers, teachers also have the goal of ensuring that their students pass their examinations. Accordingly, one teacher described teaching as examination focused:

McTTi_3:

> *Because most of the time, you will be skewed towards teaching what you know the students will be examined on. Most of the times, you are geared towards helping the students to pass.*

7.1.2 Professional competencies of TVET teachers

Having described what it means to be a TVET teacher, participants were then asked to describe the knowledge, skills, and values that one needs to be a good TVET teacher. Good TVET teachers were generally described as dynamic, confident and ethical individuals who had mastered the content they teach and could transfer that content to their students. Respondents frequently identified competent teaching as resting primarily on mastery of subject content knowledge. The excerpts below highlight this view:

Interviewer:

> *What are the specific types of knowledge or skills that you would say a professional teacher must have?*

MaTTi_3:

> *One, you must have mastery over your content, subject matter. Two, you should be able to guide learners to understand what you teach.*

McTTi_3:

> *Yes, for a teacher there is something we call subject mastery, for example if you are trained in a certain section or field, you are supposed to have mastered that*

field, so that as you transfer knowledge and skills to the trainees, you must be proficient in that area.

Mastery of content was thus seen as inseparable from the ability to transfer content to students in a way that students could understand. The phrase commonly used by the respondents was "delivery skills", referring to what is more formally described as pedagogical content knowledge.

NbTTi_2:

For you to be a good teacher, you have to have skills in being able to deliver to your students…

To support the "delivery of knowledge and skills", competent teachers were also described as having good knowledge of students and therefore having the ability to understand and respond to the needs of students. A constructivist conception of teaching was apparent with teachers being required to focus on the needs of learners. As one teacher put it, a good teacher should be able to reach students at their level:

McTTi_2:

The ability to deal with different groups of people, understand them, and to reach them at their level. It should be centred on the learner. You know when you understand the learner; you should be able to reach them at their level.

Additional competencies mentioned were skills related to evaluation of learning, guiding and helping students pass in their examinations, content and lesson planning, and classroom management. Respondents also identified competencies emanating from general pedagogical knowledge as essential. These included familiarity with current educational practices and policies and administrative competencies such as keeping records and documenting teaching activities.

Owing to their view of teaching as more than instruction, respondents also described competent teachers as having a "good character". Competent teachers are thus expected to be ethical and to have good knowledge of teaching ethics. As one teacher put it:

MaTTi_2: *For you to be a professional teacher you need the content in the area of specialization, the rest is character.*

To support the above competencies, competent teachers were also described as possessing life skills such as remaining adaptable and having life-long learning skills:

ThTTi_3:

> *As a teacher you should have a competency of acquiring additional information along the way. That should be a prerequisite; so that, as a teacher, you are not just relying on what you have used all along. You have to be up to date with your area, the happenings that have been going on in your area at that particular time. And, then, how you pass it on to the learners, how you marry it with their experiences.*

The above descriptions were categorized and then used to develop at an outline of the knowledge, skills, and attitudes that define a competent TVET teacher in Kenya. Three main categories emerged, i.e., subject content knowledge, general pedagogical knowledge, and pedagogical content knowledge. A fourth category, life skills, also emerged. The codes, emergent categories, and their associations are shown in the Figure 4.

Given that mastery of content and delivery skills were often mentioned together, demonstrable mastery of knowledge emerged as a sub-category of subject content knowledge but with significant overlap with the pedagogical content knowledge category. Knowledge of students was a subcategory of pedagogical content knowledge but it also overlapped with the general pedagogical content knowledge category.

While other competencies may be identified such as curriculum development, interview respondents did not mention them. This is possibly because they have not had the need to apply these competencies in the past.

Figure 4: *TVET Teacher Professional Competencies*

7.1.3 Self-perception of competence

Apart investigating the competencies that TVET teachers should possess, the study also investigated how confident TVET teachers felt with respect to their professional competencies. When interview respondents were asked how competent they felt at present compared to when they started teaching, all participants said they felt more competent and confident as teachers. A key area of competence development was acquisition of mastery of content knowledge and therefore the ability to deliver the content. Related to this was the development of the technical skills related to their subjects. Other acquired competencies were "knowing how to make students pass in their examinations" and "knowing how the system works".

For the survey, three key professional competence domains were used in the assessment of competence, i.e., subject-content knowledge, teaching skills and general educational knowledge. The mean-self-assessment of competence was a simple average of the three domains of teacher competence. The average self-ratings in the three sub-domains are presented in the Table 9 with respondents grouped by career stages. The results show that teachers have a relatively high perception of competence. However, New Teachers generally have a lower self-perception of competence compared to their colleagues.

Table 9: *Average-self-ratings of competency across career stages*

	Career Stages				
Teacher Competency Domain	New Teachers (0-2 years)	Junior Teachers (3-5 years)	Middle CS Teachers (6-20 years)	Late CS Teachers (20+ years)	Average
Subject Content Knowledge	3.91	4.05	4.22	4.26	4.13
Teaching Skills	3.64	3.95	4.24	4.21	4.05
General educational knowledge	3.88	4.03	4.27	4.15	4.11
Average self-assessment	3.81	4.01	4.24	4.21	4.10

To investigate if background characteristics of teachers influence the self-perception of competence, the mean-self-assessment of competence was compared across different teacher characteristics. This was done using either a T-test or an ANOVA-test depending on the background characteristic being investigated. No significant differences were found between mean-self-assessments of competence across the categories of gender, age, educational qualifications, job-group, career stage, and prior work experience. However, mean-self-rating of competence was found to be

statistically significantly higher for teachers who had received initial teacher education than for teachers who had not (*t=2.68, df= 168, p< 0.05).*

Similar analysis was done for each sub-domain of teacher competence. Statistically significant differences were found only with respect to the average-self-ratings of competence in the teaching skills competence, F (3, 166) = 4.475, p<.05. A Tukey HSD post hoc test showed significant differences between New Teachers (M=3.64, SD=0.929) and Middle Career Stage Teachers (M=4.24, SD=0.615) and Late Career Stage Teachers (M=4.21, SD=0.808). Table 9 above shows the average self-ratings of competency in the three sub-domains with respondents grouped by career stages. The average-self-ratings of mastery of subject content knowledge and general educational knowledge were not found to differ significantly among the four categories of teachers by career stage.

7.2 Research Question 2 & 3: TVET teacher CPD practices in Kenya

The second research question investigated TVET teacher CPD practices in Kenya, while the third research question focused on how personal and contextual factors influence these practices. Because the two questions are closely related and to improve coherence in the presentation of the findings, the presentation of the findings for both research questions was integrated.

7.2.1 Need for CPD and choice of content

To assess the extent to which teachers need professional development, survey participants were asked to indicate how strongly they felt the need for professional development in different sub-domains of teacher professional competence. Participants felt the greatest need to learn about new technologies in the workplace followed by learning about school management. The third most needed professional development was on learning about ICT skills for teaching. The rest of the data is captured in the Table 10.

Table 10: *Need for Professional Development*

	Perceived need for CPD	
Competence sub-domain	Mean	Std. Deviation
New technologies in the workplace	4.04	0.89
School management and administration	3.76	0.96
ICT skills for teaching	3.74	1.06
Guidance and counselling	3.63	1.00
Student evaluation and assessment	3.57	1.10
Knowledge of learners and their characteristics	3.53	1.13
Curriculum theory and development	3.50	1.07
Subject knowledge	3.42	1.10
Knowledge of educational goals, purposes and values	3.39	1.12
Teaching methods specific to my field	3.28	1.22
Mean Need for CPD	3.59	0.809

When asked what content areas their past CPD activities had focused on, subject content knowledge was cited as the most common, while school management and administration were cited as the rarest. A large percentage of the participants (85%) indicated that their prior CPD had focused on subject content knowledge. ICT skills for teaching and content related to student evaluation were the second and third most popular content areas. Content related to general pedagogical content knowledge such as knowledge related to school management and administration, curriculum development and knowledge about learners and their characteristics were the least popular. Results are indicated in Table 11.

Table 11: *Content areas covered in the past*

	If content area was covered in the past	
Content areas covered in past CPD activities	No (%)	Yes (%)
Subject knowledge	14.8	85.2
ICT skills for teaching	15.4	84.6
Student evaluation and assessment	17.8	82.2
New technologies in the work place	23.1	76.9
Knowledge of educational goals, purposes and values	24.3	75.7
Pedagogical-content knowledge	26.6	73.4
Guidance and Counselling	26.6	73.4
Knowledge of learners and their characteristics	29.6	70.4
Curriculum theory and development	29.6	70.4
School management and administration	39.1	60.9

Despite the importance of pedagogical content knowledge, more than a quarter of the respondents indicated that their past CPD activities had not focused on pedagogical content knowledge and pedagogical knowledge. Teachers thus frequently focus their professional learning on subject matter knowledge with the aim of improving mastery of subject knowledge. Content aimed at developing pedagogical knowledge and pedagogical content knowledge is less frequently chosen. This is summarized in Figure 5.

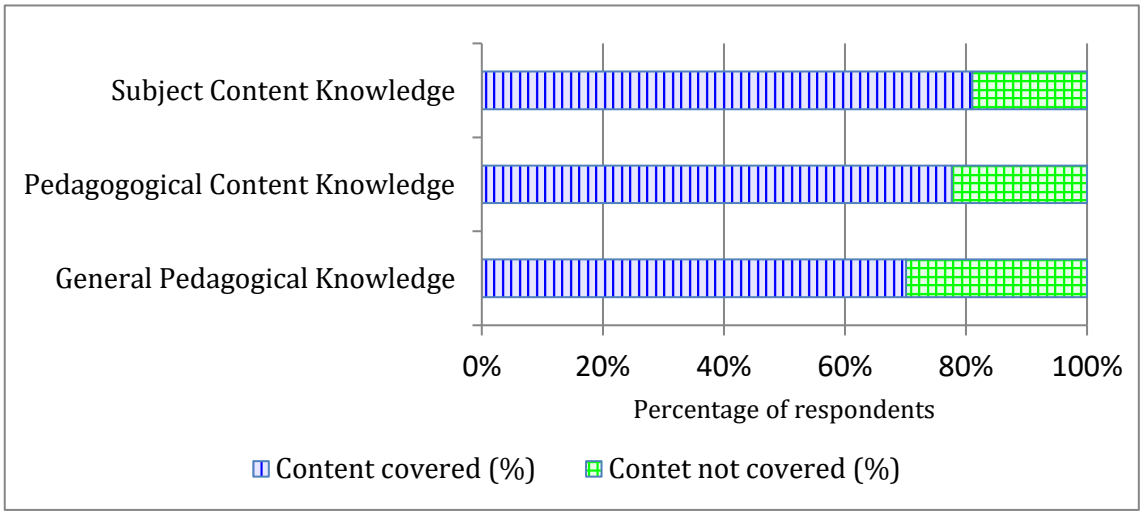


Figure 5: *Content areas covered in the past*

Both sets of data showed that teachers place a priority on subject-content knowledge. The survey data showed that teachers are most interested in improving their subject-content knowledge while interview data showed that teachers place a priority on subject-content knowledge while viewing pedagogical content knowledge as only a minor competency. Interview participants explained the stronger preference for subject content knowledge by arguing that what matters more is knowledge of subject matter, and that once teaching methods are learnt, one need not keep learning them.

KbTTi_1:

> *Okay, pedagogy contributes maybe 20 per cent. But what matters is content.*

NbTTi_1:

> *Content first, and then teaching and pedagogy to come later. After all, the pedagogy one is maybe to upgrade, some refresher.*

ThTTi_1:

> *Once teaching methods are there, it is just a matter of polishing up. But content is what changes.*

Re-looking at the qualitative data, it was noticed that the terms "delivery skills" and "demonstrable mastery of content" were used to imply good teaching skills. That is, having mastery of content meant having the ability to teach. Teachers thus appear to conflate mastery of content with good teaching skills and conceive good teaching as simply the outcome of mastery of content. Thus, while good teachers were described as those who possess good delivery skills, these skills were assumed to rest solely on having good mastery of content rather than on developing subject specific teaching methods. In fact, when asked about subject specific teaching methods, one teacher admitted that she was not very familiar with the concept:

Interviewer:

> *It seems like a lot of focus is on content, things like what to teach, content knowledge. But what about the pedagogical content knowledge, things like how to best teach that content? Do teachers focus on this? Have you for example ever tried searching for special methods in teaching mechanical technology?*

KbTTi_2:

> *No. Maybe now I will do it because you have given me an idea. I have never thought of that. Like that one of [Technical] drawing; we always have a problem teaching that.*

Interviewer:

> *But technical drawing is a very abstract thing. How do teachers improve their teaching skills in it?*

KbTTi_2:

> *Hey, no. That one I have no idea. They just do it and hope it works.*

Some teachers though were aware of the importance of pedagogical content knowledge in enabling good teaching:

McTTi_1:

> *Yeah, the pedagogical skills are very important. Because you might have the content, but then you do not know how to deliver the knowledge. You maybe do not know how to use the chalk board effectively, or even how to explain some of the concepts.*

While some teachers are aware about subject specific teaching methods, they seem not to have had a chance to develop such knowledge and the related skills during their teacher training. Mirroring the case of the Technical Drawing teacher above, one mathematics teacher lamented that he had never really been taught how to teach mathematics. Instead, he had to develop the required knowledge and skills by himself:

MuTTi_1:

> *I look at this way: I lecture mathematics today, and when you look at the mathematics I teach, it is what I did in my diploma. No one ever came in to bring the issue of how to actually teach mathematics. It is me, as a mathematics teacher who had to find ways of how to actually teach mathematics.*

Choice of content and teacher characteristics

To assess if teacher characteristics influence what teachers focus their CPD on, the choice of content was compared against different aspects such as gender, career stage, teaching area, and non-teaching responsibility. The chi-square tests were not significant, and it can therefore not be said that the above teacher characteristics influence the content teachers cover in their CPD. However, statistically significant differences were found with respect to if a teacher had received pre-service teacher education or not with respect to all content areas apart from subject-content knowledge and content related to new technologies in the work-place. Teachers who had undergone preservice teacher education were more likely to focus their CPD on all the other content areas compared to teachers who had not undergone pre-service teacher education. Results are shown in Table 12. This finding leads to the conclusion that pre-service teacher education has a

positive effect in sensitizing teachers on the value and importance of pedagogical content knowledge and general pedagogical knowledge.

Table 12: *Content choice and pre-service teacher education*

If content covered in past CPD activities		ITE received or not				
		Has ITE	No ITE	Chi-square	df	Sig.
Subject-content knowledge (knowledge and skills specific to my field)	No	19	6	0.374	1	.541
	Yes	117	27			
New technologies in the work place	No	28	11	2.430	1	.119
	Yes	108	22			
Pedagogical-content knowledge (teaching methods specific to my field)	No	24	21	28.749	1	.001
	Yes	112	12			
ICT skills for teaching	No	16	10	7.011	1	.008
	Yes	120	23			
Knowledge of learners and their characteristics	No	34	16	7.031	1	.008
	Yes	102	17			
Student evaluation and assessment	No	18	12	9.730	1	.002
	Yes	118	21			
Knowledge of educational goals, purposes and values	No	25	16	13.096	1	.001
	Yes	111	17			
Curriculum theory and development	No	32	18	12.263	1	.001
	Yes	104	15			
Guidance and Counselling	No	29	16	10.028	1	.002
	Yes	107	17			
School management and administration	No	45	21	10.412	1	.001
	Yes	91	12			

7.2.2 Learning methods

The study also sought to identify the learning methods TVET teachers in Kenya use as part of their CPD. Interview participants were thus asked to describe the processes through which they develop and maintain the knowledge, skills and values that they need to be competent. In agreement with the earlier finding that TVET teachers identify good teachers as those with good mastery of content and good delivery skills, teacher CPD was predominantly conceptualized as, and practiced as, any activity that led to improved delivery of knowledge and skills to students. These activities included information search, professional dialogue with colleagues and attending workshops and conferences. Experience and prior work experiences were also identified as important avenues through which teachers acquire and develop their competencies.

Analysis of the interviews revealed that the participants had participated in different CPD activities. Formal CPD activities included short and long courses leading to the

award of certificates and diplomas, university courses and graduate studies, workshops and seminars. Informal CPD activities included information search and reading of printed materials, use of online media including YouTube, and professional dialogue with colleagues. The survey provided a more detailed view of learning methods teachers use. These findings are presented below.

*7.2.2.1 **Formal CPD activities***

Teachers reported a high prevalence of formal CPD activities. Other than for participation in educational conferences, more than three quarters of the survey participants indicated that they had participated at least once in a workshop or seminar, a short training course or a university course. Further, at least half of the participants indicated that they had participated twice or more in such formal CPD activities. However, teachers appear to lack opportunities for participating in educational conferences, with more than a third indicating that they had never attended an educational conference. Results are summarized in Table 13.

Table 13: *Frequency of participation in organized and formal CPD*

Organized and Formal CPD Activity	Never (%)	Once (%)	At least twice (%)
Workshops and Seminars	13.5	27.1	59.4
Short training courses	14.1	33.5	52.4
College and university courses	23.7	26.6	49.7
Online courses	26.5	24.1	49.4
Educational conferences	35.5	25.4	39.1

Formal CPD and educational qualifications

To assess the use of formal education as part of teachers' CPD, the educational qualifications of the participants at the start of their teaching careers were compared with their current educational qualifications. It was found that 34 per cent of the participants started teaching with only a Diploma Certificate while 64.7 per cent started teaching with a Bachelor's degree. At present only 16.5 per cent still have a Diploma Certificate while 57.6 per cent have a Bachelor's degree. On the other hand, while only 2 (i.e., 1.2%) of the respondents started teaching with a Master's degree, the proportion of teachers with a Master's degree has increased to 42 (i.e., 24.7 %). Further, two of the participants have acquired a PhD degree. The cross tabulation of entry qualifications with present academic qualifications is shown in Table 14. There has thus been a big progression in academic qualifications, which shows a strong use of formal academic

CPD to improve educational qualifications. This findings agree with earlier findings by Ferej et al. (2012) that a large proportion of teachers with non-university diploma enrol for Bachelor Degree programs or for the Higher National Diploma programs.

Table 14: *Educational qualifications at entry into teaching by current educational qualifications*

		Highest level of education at present				
		Diploma	Bachelor	Masters	PhD	Total
Entry qualifications into teaching	Diploma	28	21	8	1	58
	Bachelor	-	77	32	1	110
	Masters	-	-	2	-	2
	Total	28	98	42	2	170

Formal CPD and non-teaching responsibilities

When participation in formal CPD activities was compared against different characteristics of teachers, a statistically significant association was observed between participation in conferences and the non-teaching responsibilities held by teachers $\chi 2(12)=20.81$, $p<0.001$. Teachers with administrative responsibilities were found to participate more frequently in educational conferences compared to their colleagues who held no non-teaching responsibility. The differences in participation are shown graphically in **Figure 6**.

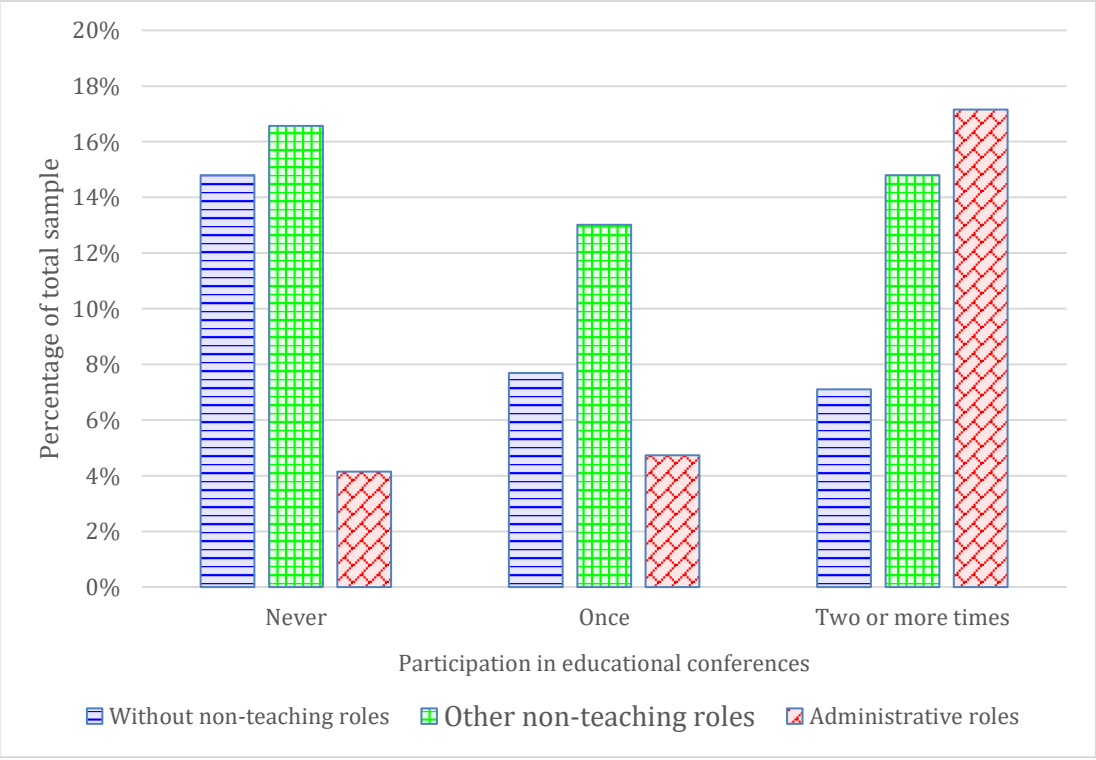


Figure 6: *Participation in educational conferences and non-teaching roles*

As can been seen, nearly 18 per cent of the teachers with administrative responsibilities indicated that they had attended educational conferences twice or more compared with about 7 per cent of those without non-teaching responsibilities. On the other hand, while more than 14 per cent of those without non-teaching responsibilities had not had a chance to attend an educational conference, only 4 per cent of those with administrative responsibilities indicated that they had never had a chance to attend an educational conference.

To explain the above pattern, one interview participant, who is a dean, succinctly pointed out that teachers with non-teaching responsibilities have an upper hand in accessing formal CPD opportunities:

Interviewer:

> *Does the responsibility of being a dean increase your chances of getting opportunities for engaging in professional development activities, e.g., going for a conference, or a short training course?*

MuTTi_2:

> *Of course, yes. It does because there are courses that are designed for specific positions. Sometimes letters come saying send us your dean of students; send us someone with this and that, so you being in that position gives you have an upper hand.*

*7.2.2.2 **Collaborative CPD activities***

With respect to collaborative CPD practices, co-teaching and mentoring are the most popular collaborative CPD practices, with three quarters of the participants indicating that they had participated in mentoring and coaching other teachers at least once. On the other hand, practices such as participating in teacher clubs, visiting other schools, and supervision other teachers, are relatively rare with more than half of the participants indicating that they had never participated in such activities. This could be due to the absence of such opportunities and the costs associated with participating in such activities. Table 15 summarizes the frequencies reported in the survey with respect to collaborative CPD activities.

Table 15: *Frequency of participation in collaborative CPD activities*

Collaborative CPD activity	Never (%)	Once (%)	At least twice (%)
Co-teaching (teaching the same lesson with another teacher)	28.8	25.9	45.3
Lesson observations (Lesson study with other teachers)	30.6	35.9	33.5
Mentoring and coaching of other teachers	25.3	25.3	49.4
Participation in teacher clubs	55.3	23.5	21.2
Visiting other institutes and schools to observe their teaching practices	52.9	26.5	20.6
Supervising other teachers	49.7	20.7	29.6

From the interviews, it was clear that teachers appreciate the value of collaborative learning activities. However, and in agreement with the survey, they said such collaborative learning activities rarely take place. One teacher was enthusiastic of team teaching arguing that it helps both the learners and the teacher:

ThTTi_1:

> *Learners benefit from the better placed person; I also learn from a better placed person*

However, these activities are rare:

NbTTi_1:

> *Well…we have rarely done that.*

The participants went on to explain that collaborative learning activities are rare due to lack of time and the lack of a framework to guide collaborative and other informal learning practices.

ThTTi_1:

> *Not particularly, time does not allow.*

NbTTi_1

> *The aspect of team teaching has become a challenge. Getting two people at one place at the same time is a bit difficult. You can maybe share some knowledge,*

but not real practical collaboration whereby you have two or three people at the same time, complementing what the other is doing … it is a bit difficult.

The wide spread lack of collaborative learning practices was also deemed a cultural issue. In this case, in the absence of prior attempts to institute collaborative learning practices, a culture of collaborative learning has not emerged. Teachers have thus retained the practices that they are familiar with.

NbTTi_1:

It is a cultural issue; at times we go as per what has been going on.

One teacher was emphatic that the organizational culture at present did not support collaborative teaching practices. In her opinion, teachers in her institution lack the openness and collegiality that supports collaborative learning and blamed this on the competitive nature of the examinations where student performance is seen as a teacher's performance.

The interviews further revealed that co-teaching refers to sharing topics, rather than actively teaching together in the same classroom. Similarly, while more than two thirds of the survey respondents indicated that they had been involved in lesson study, interview participants revealed that lesson study is actually rare with many teachers being apprehensive of having their teaching practices actively analysed by others. Instead, lesson observations cited by the survey participants related to short lived activities that took place when the teachers' employer issued a directive requiring lesson observations to be undertaken.

Other models of collaborative learning such as school visits were also identified as rare. However, institutions sometimes carry out benchmarking activities where they visit other institutions to see what takes place in those institutions. But these activities do not normally involve teachers per se, but their Heads of Departments (HoDs). The benchmarking exercises therefore take on a more or less administrative approach and focus on management challenges rather than taking on a pedagogical approach focusing on how teachers can better teach or improve their teaching skills. Moreover, the benchmarking activities fail to benefit teachers because learning is not cascaded downwards:

KbTTi_1:

> *Basically, it is learning how the other institutes run, the mode of operation and their timetable, how they structure the timetable, the content and so on. The books they use, the issue of financial management. How they run their day today budget, the structure of their activities, and so on. That is what we used to look at.*

The school visits often take place to support the growth of the TVCs in starting new academic programs:

MaTTi_2:

> *Yes, …. we went to a sister institution of the same level, first, with the teachers to know their programmes, because we also wanted to introduce new programmes, we wanted to know what the programmes require, then generally, how do they run their activities.*

Collaborative CPD and teacher characteristics

When participation in the collaborative CPD activities was compared against different teacher characteristics, teachers in their middle and late career stages were found to participate more frequently in mentoring and coaching activities compared to teachers in the early career stages $\chi2(4) = 15.024$, $p = 0.005$. Middle and late career stage teachers were found to have participated more often in supervising other teachers than their early career stage teachers $\chi2\ (4) = 33.835$, $p < 0.001$. An association was also found between having being trained to work as a teacher and mentoring and coaching other teachers ($\chi2\ (4) = 27.667$, $p < 0.001$), supervising other teachers ($\chi2\ (4) = 14.183$, $p < 0.001$) and participating in educational conferences ($\chi2\ (4) = 13.993$, $p < 0.001$).

*7.2.2.3 **Embedded CPD***

The survey revealed that embedded CPD activities are relatively rare. For example, more than half of the survey participants indicated that they had never written reflections about their practices and outcomes, while only a quarter of the participants said they had participated in curriculum development activities in two or more occasions. The results are captured in Table 16.

Table 16: *Frequency of participation in practice embedded CPD activities*

Practice based CPD activity	Never (%)	Once (%)	At least twice (%)
Lecturer Industrial Attachment	35.9	29.4	34.7
Designing and improving content and learning materials	30.0	35.9	34.1
Writing reflections about practices and their outcomes	53.5	28.2	18.2
Being involved in research activities	29.4	34.1	36.5
Curriculum development	37.6	35.9	26.5
Developing or marking of national exams	42.9	17.6	39.4

Interviews supported the above findings. For example, interviewees indicated that instead of writing reflections about practice and outcomes, they would rather discuss their experiences with colleagues.

Embedded CPD and teacher characteristics

When participation in practice based CPD activities was compared against different characteristics of teachers, a statistically significant association was observed between participation in designing and improving content and the non-teaching responsibilities held by teachers $\chi 2(4)=14.75$, $p<0.05$. Teachers with administrative responsibilities were found to participate more frequently in designing and improving content and materials than teachers without administrative responsibilities. Moreover, teachers with administrative responsibilities participated more frequently in curriculum development activities than teachers without administrative responsibilities $\chi 2\ (4) =11.825$, $p<0.05$.

A similar pattern was observed with respect to career stages where an association between career stage and participation in designing and improving content was observed, $\chi 2(4) = 20.99$, $p<0.001$, as well as, between career stage and participation in curriculum development $\chi 2(4) = 22.17$, $p<0.001$. Middle career stage teachers and late career stage teachers participated more frequently in designing and improving content as well as in curriculum development compared to early career stage teachers.

Use of Lecturer Industrial Attachment (LIA)

Lecturer Industrial Attachment (LIA) i.e., work or industry placement for vocational teachers involves teachers visiting work places or industrial firms for extended periods of time to maintain and improve their knowledge and skills related to emerging technologies and modern work process. Despite the important role played by LIA in

keeping TVET teachers up to date with modern work practices and industrial technology, more than a third of the participants indicated that they had never attended Lecturer Industrial Attachment. Asked for their views on LIA, more than 90 per cent of the participants agreed that LIA is an important learning activity for teachers. In line with this view, 87 per cent of the respondents wished to attend LIA. However, only 40 per cent of the respondents were willing to pay to attend LIA. Participants were also polled on preferences for LIA frequency and duration. The most popular preference was once a year for four weeks.

Interview discussions suggested that LIA could be even rarer as some interview participants were not aware that they could and should attend LIA while others confused Student Industrial Attachment (internship) with Lecturer Industrial Attachment. Overall, the interviews showed that LIA remains rare in Kenya:

MaTTi_2:

> *For the twelve years, I have not seen it. Not any. We only concentrate on students going out.*

KbTTi_1:

> *That this is good, if it is there. But in Kenya we do not really have it. If teachers [were] to go to industry and try to link what they teach with what happens in industry, it would be good. But to the best of my knowledge, it does not exist.*

Interview participants further observed that, apart from the lack of time due to heavy workloads, there are no policies to guide attendance to LIA. As such, teachers lack clear pathways to attend LIA and find it difficult to access facilitation for attending LIA. Lack of LIA was also attributed to the fact that the training institutions lack linkages with industrial firms. These views were crystalized in the interview excerpts below:

MuTTi_1:

> *There is no time, no policy, and a lot of content to deliver and bulky work for no good reason, and lack of industrial wish. Most of the teachers retire from teaching [with] what they saw decades ago as they were attached as students. ... Personally, I am teaching what I saw ten years ago and I will go on like that. The education*

institutions work independently of the industry and therefore if there is no connection between the two, teachers lack ways of going to industry.

ThTTi_3:

... you see, one of the key factors is money, and workload, ... and there is no formal policy to mandate this, maybe if there was a policy saying that you have to attend LIA after this period, maybe most of us would be doing it. But if it is on your own initiative, it may be difficult.

Even the factories may lack the arrangements to attach you. Sometimes even seeking attachment may not be as easy as it may seem.

*7.2.2.4 **Self-directed and self-paced CPD activities***

Compared to the CPD activities presented above, self-paced learning activities are much more common. For example, nearly nine in ten of the survey participants indicated that they participate in discussions about practice occasionally, while more than three quarters of the participants indicated that they frequently read content related to their teaching subjects. More than two thirds of the participants indicated that they watch videos related to their teaching subjects. However, reading educational theory is less common with a quarter of the participants saying they never or rarely read content related to educational theory. Results are shown in Table 17.

Table 17*: Frequency of participation in self-paced CPD activities*

Self-Paced CPD activity	Never/rarely (%)	Occasionally (%)	Frequently (%)
Discussions about teaching practices with other teachers (professional dialogue)	11.8	44.4	43.8
Watch videos about teaching methods and practices	26.4	33.5	40.0
Read about my teaching subjects	5.3	19.5	75.2
Watch videos about my subjects	12.9	20.6	66.5
Read educational theory	24.8	36.1	39.1

Use of professional literature

Related engaging in self-paced learning activities is the use of professional literature. The survey revealed that teachers rarely use primary and secondary literature as part of their professional learning. Instead, they rely more on text books for their professional learning. Nearly half of all the respondents indicated that they use primary literature

rarely, while more than half of the respondents indicated that they use tertiary literature frequently. Primary literature was classified as original research articles found in journals, while secondary literature was classified as review articles, and practice guidelines. Tertiary literature was classified as text books, handbooks and encyclopaedias. Finally, grey literature referred to policy and curriculum documents etc. This contradicts the expectation that TVET teachers would use primary and secondary literature to keep abreast of new developments in their fields. However, this agrees with the finding that teachers do not frequently engage in research activities. Table 18 shows the frequency of using different types of professional literature.

Table 18: *Frequency of using professional literature*

	Never/Rarely (%)	Occasionally (%)	Frequently (%)
Primary Literature	49.4	28.2	20.6
Secondary Literature	40.6	31.8	25.9
Tertiary Literature	16.5	28.8	54.1
Grey Literature	35.3	32.9	30.0

When asked why they read professional literature, majority of the study participants (89 per cent) indicated that they use professional literature to keep their knowledge up to date. On the other hand, using professional literature as part of their work or for research purposes is much more infrequent: only one in five of the participants indicated that they use professional literature as part of their post-graduate studies or for research purposes. Only a third of the respondents indicated that they use professional literature as part of their work, i.e., to solve specific practice problems. Findings are summarized in Figure 7.

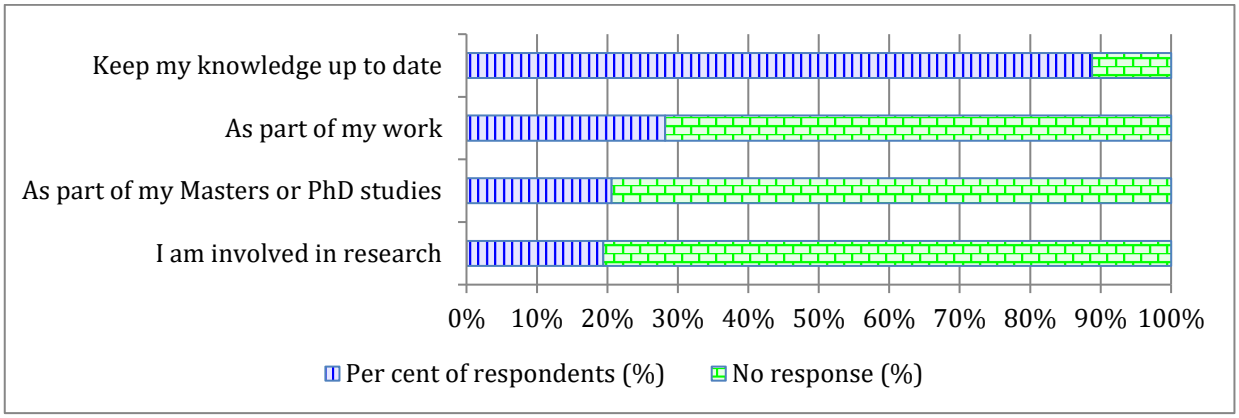


Figure 7: *Reasons for reading professional literature*

*7.2.2.5 **Induction and mentorship in the TVET institutes***

Mentoring provides invaluable support to new and beginning teachers and contributes to the long-term professional development of both mentee and mentor teachers. To assess the use of mentorship as a collaborative learning method, participants were asked to describe mentorship practices in the TVCs. Analysis and coding of the interviews resulted in the codes and code categories shown in Table 19. For brevity, some of the codes and code categories have been combined and reworded.

The first category shows that teachers appreciate the value of mentorship and feel that mentorship should be carried out. Despite this positive view, the second and third categories show that that mentorship for beginning teachers is limited, and that when it does take place, it is unstructured. The fourth category identifies the approaches commonly used to mentor beginning teachers. The last category identifies explanations for the identified practices, and in particular, reasons why mentorship remains limited in the training institutes.

Table 19: *Mentoring codes and code categories*

Code (Descriptions of mentorship)	Code category
Prevent the frustration I felt Creating rapport between new teachers and students Dispelling misconceptions Help new teachers learn how to teach and evaluate students	Importance of mentorship
Mentorship is not very common New teacher struggle on their own You are left on your own; I would say I learnt it on the go I was confused and intimidated	Absence of and need for mentorship
Depends on the mentor and mentee Assuming that help will be readily available Un-sustained prior attempts	Mentorship as unstructured
Mentorship as introductions and orientation Engaging in supportive dialogue Explaining expectations and the syllabus Incidental interactions between teachers Assigning new teachers to more experienced teachers	Approaches to mentorship
Need for mentorship is not acknowledged, hence it lacks No time for mentorship Not very formalized; no guidelines for mentorship	Reasons why mentorship lacks

Further analysis of the survey data and the interview data provided a richer picture of mentorship practices in the TVCs and identified tenable reasons to explain the practices. These are briefly described below.

Mentorship is valued

From the interviews, it was clear that the interview participants felt that mentorship for new and beginning teachers is important and should be carried out. A principal reason given for mentoring new and beginning teachers was the incompleteness of Initial Teacher Education and the resulting difficulties that new teachers face, as well as the risk that their students might fall into owing to being taught by poorly prepared teachers. Mentorship was thus described as essential in helping teachers start their teaching careers and dispelling misconceptions about teaching. Other benefits identified included creating good rapport between the new teachers and their colleagues and students.

To assess the prevalence of mentorship in the TVCs, survey respondents were asked to indicate how frequently they participate in different mentoring activities. As indicated in Table 20, teachers prefer to offer advice and engage in discussions about practice and do so frequently. On the other hand, collaborative activities such as allowing other teachers to observe their teaching are relatively rare: more than 30 per cent of the survey respondents said they rarely or never allow other teachers to observe their lessons.

Table 20: *Frequency of participating in different mentoring activities*

Mentorship activity	Never/ Rarely (%)	Sometimes (%)	Frequently/ Very Frequently (%)
I advise new and junior teachers	12	33.3	54.8
I participate in discussions about practice	6.5	30.4	63.1
I allow other teachers to observe my lessons	36.3	33.3	30.4
I participate in co-teaching	29.2	33.9	37

These survey findings were corroborated by the interviews. When asked to describe how mentorship takes place in the TVCs, interview respondents frequently described mentorship in terms of dialogue between teachers. A senior teacher who said that he had voluntarily mentored other teachers described mentorship as follows:

ThTTi_1:

> *It is like when I can point out things to them and they are now able to become better without having to go through the experiences that I had to go through.*

Further quantitative analysis was done on the survey data to assess how mentoring and coaching other teachers varies with teacher characteristics. This was done by cross-tabulating the frequency of mentoring other teachers with teacher characteristics such as age, gender, and educational qualifications etc. After cross-tabulating the frequencies, chi-square values were taken to identify significant associations. No significant associations were identified. However, a majority (44 per cent) of young teachers in the 20-25 years bracket stated that they had never mentored or coached others.

Similar analysis was done to assess the relationship between mentoring and non-teaching responsibilities. Thus, the frequency of participation in mentorship was cross-tabulated with non-teaching responsibilities and a chi-square test taken. The results are shown in Table 21. While 42 per cent of teachers without non-teaching responsibilities said that they had never mentored other teachers, only 18 per cent of teachers with non-teaching responsibilities said that they had never mentored other teachers. The chi-square test was significant, X^2 (1, N = 170) = 10.46, p>0.001, hence the conclusion that teachers with non-teaching responsibilities are more likely to mentor other teachers.

Table 21: *Mentorship and Non-Teaching Roles*

		Non-teaching responsibility		
		No	Yes	Total
Mentoring other teachers	Never (%)	42.0	18.3	25.3
	At least Once (%)	58.0	81.7	74.7
	Total (%)	100	100	100

Structured mentorship is rare

While the questionnaire data suggests that mentorship as relatively frequent, many interview respondents revealed that mentorship for new and beginning teachers was rare and incidental. Further, there are no policies or guidelines to guide the mentorship of new and beginning teachers. Asked to describe the mentorship that he had observed at the institute where he teaches, one teacher responded as follows:

MaTTi_1:

> *I have not seen any meaningful mentorship. We do not have a structured programme that says you are supposed to learn from this guy and vice versa.*

Other interview respondents were more critical of what takes place with respect to mentorship and felt that in many cases new teachers lack any form of mentorship and are generally thrown into the deep end and left to sink or swim. The vignette below captures the general state of mentorship that came up from the interviews:

Interviewer:

> *So, you did this, but from your experience with other teachers, is this kind of mentorship common?*

MuTTi_1:

> *No. No. No. Many teachers learn on their own. Young teachers are struggling.*

A new teacher who had recently been employed gave his experience:

KbTTi_1:

> *Basically, I was suffering…the attention here is very minimal. So, you just need to be quick to observe how they do things and learn. You swim along the tides. Here there is no attention. Someone comes, does his work and goes away.*

Finding one's way is thus how new and beginning teachers start their careers. The frustration they experience was captured by one young teacher:

McTTi_2:

> *I found my way. It was confusing at first. I felt overloaded with information....and before too long, I was given a responsibility. So, I had to find a way…But I was not, I haven't, I wasn't mentored.*

Early career stage teachers thus struggle and often face significant challenges in completing their tasks. One poignant case demonstrates the lack of mentorship and the

difficulties that result as Early Career Stage teachers handle tasks that they are ill-prepared for and are unguided about:

MaTTi_2:

> *A new teacher was asked to assess the students; there is an external examiner and a co-marker from the institute. And at one point the external examiner requested to have a different co-marker, because the co-maker assigned to him was unable to mark?*
>
> *But why was he unable to mark? Nobody guided him; somebody just gave him the forms and told him to go to the workshop and mark. He had never done something similar. Nobody had given him any guidance. And it happens; there was that complaint in a number of institutions.*

However, it appears that some teachers and some institutions actively mentor and support their new teachers. One teacher pointed out that her negative experience as a new teacher had pushed her to try and institute a more systematic approach to mentoring new teachers in her department. Accordingly, she tries to pair up new teachers with more experienced teachers who do not have administrative responsibilities.

MuTTi_2:

> *Personally, I was the head of building [and civil engineering department]; we call them and pair up with another teacher. And the older teacher helps provide notes, explain some of the things not clear to them, and guide them, and encourage them to consult in case of a problem. So, we pair a new teacher with an existing teacher. They guide them, for example how to filter notes from a book, what is the best approach and so on.*

Reasons for lack of mentorship

The preceding analysis shows that mentorship of TVET teachers in Kenya is valued yet not extensively carried out. Aiming to find out why this is the case, the interview data was relooked at, and three reasons were identified. One reason for the failure to mentor new and beginning teachers appears to be stem from how mentorship is conceptualized and therefore how it is practiced. Mentorship has been construed as introduction and

orientation rather than as a supportive relationship between a more experienced teacher and a new teacher. As such it is assumed that introductions are enough to support a new teacher to start teaching and do so successfully.

McTTi_3:

> *Normally, as I have said, once you are a new teacher, as the first thing, you are introduced to members of staff, especially in the department, and also, maybe the entire teaching staff, then from there, you are also introduced to the other support staff, the library, and slowly, you keep adjusting.... whatever you go through, somebody will be there to assist you…not really appointed, but on a friendly basis … somebody will assist you.*

While introductions to colleagues and being oriented to the new environment is part of mentorship, these activities constitute a very small part of what mentorship is. The poor conceptualization of mentorship thus acts to constrain mentoring activities. Activities that involve active observation of teaching practices and giving feedback are thus rarely used as part of mentorship. Instead, teachers offer advice and participate in discussions about practice.

Another reason that explains the failure to provide extensive mentorship to new teachers relates to the lack of time. Asked to explain why mentorship lacks, a common response was that teachers lack of time. In addition, owing to understaffing in the TVCs and the resultant heavy workloads, teachers lack time to support beginning teachers. Instead, each teacher has to figure out on his or her own how to teach effectively and deliver good results. This was highlighted in the comment below:

Interviewer:

> *Why does this kind mentorship lack?*

MaTTi_1:

> *One, you realize that we have a shortage; for a very long time, we have been understaffed. So, a new teacher comes to fill a vacuum; there is no room for wasting time to learn his new environment. He is supposed to move into full production immediately.*

The pressure of exams further limits the time available to engage in in-depth mentorship, despite the need being felt. A teacher with administrative responsibilities pointed out that despite identifying the need for mentoring new teachers; it pays more in terms of pass rates to focus attention on students who will be examined. As a practical solution, new and beginning teachers are rarely assigned students who are due to sit for national examinations.

MuTTi_3:

> *There was one time we had done a feasibility study … and I could see the need for extra training was coming up in the report, but on the ground, sometimes, there is no time for more in-depth mentorship.*

7.3 Research question 4: Outcomes and effectiveness of past CPD activities

The fourth research question took a more evaluative form and investigated the outcomes and effectiveness of TVET teacher CPD practices in Kenya.

7.3.1 Impact and outcomes of TVET teacher CPD

When asked to identify the outcomes of their past CPD activities, teachers felt that participating in CPD had led to improved confidence, improved teaching skills and improved student performance. In contrast, many respondents felt their CPD had not resulted in career progress, appointment to managerial positions, or respect from colleagues. Results are captured in Table 22

Table 22: *Perceived Benefits*

Perceived Benefits	None/ Limited (%)	Moderate (%)	Large/ V. Large (%)	Mean
Improved student performance in national examinations	3.6	16.1	80.4	4.05
Improved teaching skills	0.6	15.4	84.0	4.16
Improved confidence in myself as a teacher	1.0	11.2	87.0	4.27
Career progress i.e., promotion	18.9	23.1	58.0	3.5
Appointment to managerial position	39.6	25.4	34.9	2.86
Improved respect from colleagues	20.7	23.7	55.6	3.42

Interview participants further revealed that it is difficult to associate promotions and pay increases with their CPD. They felt that promotions, pay rises, and appointment to senior positions are weakly linked with participation in learning activities, whether those learning activities are formal or informal. The vignettes below illustrate this:

Interviewer:

> *What about a promotion?*

NbTTi_2:

> *[Laughing] Just more responsibilities, but promotions and money, not yet.*

ThTTi_2:

> *It is actually not there. For us, even if you get your Masters, you will not get any increment. … But the issue of money? No, we do not. I didn't go back to school to get it. Ok, I wanted a higher job group, but the promise that you get your Masters and then there is an automatic increment is not there.*

As the second excerpt shows, TVET teachers in Kenya are well aware that they are unlikely to obtain significant pecuniary benefits from their formal CPD. They therefore seek non-pecuniary benefits from their CPD:

MuTTi_1:

> *No. No. I have not gotten any promotions because of my education. I have gotten zero. That is for sure. If it was like that, I would regret the money I used for my Masters.*

McTTi_2:

> *No. Nada. No. I do not even know whether it will ever be. … That is the point you reach and say, it is for self-actualization. It is a dream I have achieved....I feel satisfied. If someone is doing it hoping to get something....most likely it will not translate into anything. It can only be an added bonus.*

*7.3.1.1 **Change in teaching practices due to CPD***

To assess the effects of teacher CPD on teaching practices, survey participants were asked to evaluate the extent to which their CPD activities influence their teaching practices. The most common effects were updating teaching content and providing demonstrations in class. The least common effect was being able to collaborate with other teachers. Results are summarized in Table 23.

Table 23: *Change in practice due to CPD*

Change in practice due to CPD	Rarely (%)	Sometimes (%)	Frequently (%)	Mean
I update the content I teach in class	1.8	18.3	79.9	4.02
I provide demonstrations during practical lessons	4.7	16.0	79.3	4.03
I use different teaching methods	3.0	18.3	78.7	4.09
I deal with classroom challenges more effectively	5.9	18.3	75.7	3.96
I use more effective student assessment methods	4.7	23.1	72.2	3.93
I am able to collaborate with other teachers	7.1	21.9	71.0	3.88

To assess the impact of different content areas on teaching practices, survey participants were asked to rate the impact of different content areas on their teaching practices. Results are summarized in Table 24. As can be seen, all content areas were perceived to have relatively strong impact on teaching and professional practice.

Table 24: *Perceived impact of CPD content*

Content Area	Perceived impact of content		
	Moderate to high (%)	None to small (%)	Mean Impact
Subject-content knowledge	89.9	10.1	3.77
New technologies in the work place	85.8	14.2	3.74
Pedagogical-content knowledge	81.7	18.3	3.63
ICT skills for teaching	89.3	10.7	3.84
Knowledge of learners and their characteristics	76.8	23.2	3.61
Student evaluation and assessment	87.6	12.4	3.71
Knowledge of educational goals, purposes and values	82.1	17.9	3.60
Curriculum theory and development	76.8	23.2	3.46
Guidance and Counselling	79.9	20.1	3.47
School management and administration	73.7	26.3	3.40

As reported above, subject-content knowledge is the content area teachers learn the most, but it also the content area with the largest perceived impact: 90% of the respondents felt that CPD related to subject-content knowledge had moderate to high

impact. Content related to ICT skills for teaching and content related to student evaluation were also reported to have strong impact on teaching practices. On the other hand, more than a quarter of the respondents felt that content related to school management has little or no impact. Interestingly, more than a fifth of the respondents felt that content related to knowledge of learners and their characteristics, and curriculum theory have little or no impact on their teaching and professional practice.

Summarized by content areas, TVET teachers in Kenya find subject content knowledge to be the most impactful content, followed by pedagogical content knowledge. This is summarized in Figure 8.

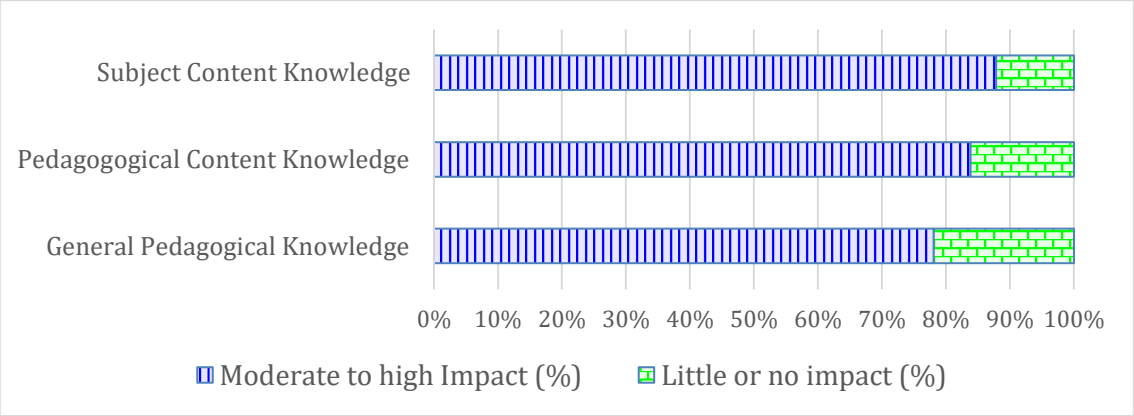


Figure 8: *Perceived impact of CPD content*

To assess if the perceived impact of a given content area influences the choice to focus learning on that content area, the perceived impact of the different content areas was compared to responses of whether the content area had been covered in the past. An apparent correlation was found between having covered a given content area and how impactful the content area was perceived to be. This is graphically demonstrated in Figure 9.

As can be seen, teachers who felt that a given content area had high to moderate impact also stated that that they had focused their learning on that content area. On the other hand, teachers who felt that a given content area had little or no impact stated that their past CPD activities did not focus on that content area.

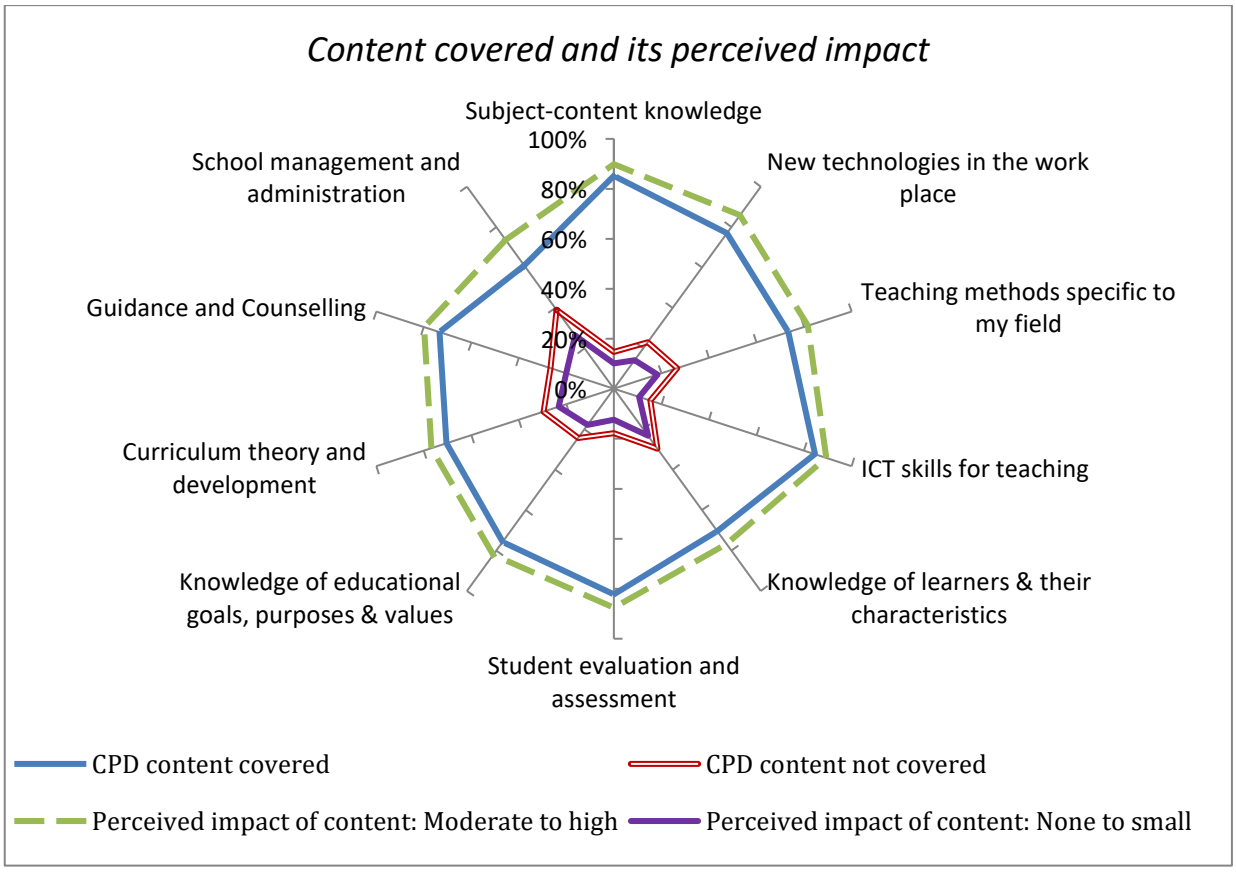


Figure 9: *Content covered and its perceived impact*

From the figure, it is clear that majority of the teachers find that the biggest impact comes from focusing on Subject Content Knowledge (SCK): nearly 90% of the respondents indicated that they felt SCK had moderate to high impact on their teaching and 85 % of the respondents indicated that their previous CPD had focused on SCK. Conversely, with more than a quarter of the respondents indicating that content on school management and administration had little or no impact on their teaching, almost a quarter of the respondents indicated that they had previously not covered that content area.

7.3.2 Effectiveness of CPD

To assess how effective past CPD activities were, participants were asked to assess the extent to which the CPD activities they had participated in met the criteria for effectiveness identified by Desimone (2009). To make the assessment, participants used a five-point Likert type scale to rate how frequently past CPD activities could be characterized as relevant, coherent, collaborative, active, and of sufficient duration.

Majority of the teachers felt that their CPD activities had covered content that was relevant to their work and that the covered content was coherent and well organized. However, a significant percentage of the participants also found that their CPD activities were not of sufficient duration and that the activities were rarely collaborative, or were only collaborative in some activities. Table 25 shows a summary of the data.

Table 25: *Effectiveness of prior CPD activities*

Core features of CPD	Rarely (%)	In some activities (%)	In most activities (%)	Mean
Content that was relevant to my work as a teacher	11.3	23.2	65.5	3.61
Content that was coherent and well organized	16.1	26.2	57.7	3.45
We were a group of teachers	19.0	32.1	48.8	3.27
Learning was active and interactive (i.e., not just lectures)	21.0	26.9	52.1	3.31
Collaborative learning activities with other teachers	20.8	35.7	43.5	3.23
Sufficient duration (several occasions spread over weeks or months)	34.5	31.5	33.9	2.99

The six attributes were combined into a single measure of the effectiveness of past CPD activities. The combined mean rating was 3.31, implying that TVET teacher CPD is not highly effective, and that the criteria for effective CPD is only met in some activities.

To assess if different teacher characteristics influenced the likelihood that a teacher's past CPD activities were effective, the mean value of the effectiveness of past CPD activities was compared for different categories of teachers (e.g., by age, gender, career stage etc.). The mean values were only significantly different for teachers who had received initial teacher education (M=3.40, SD=.82) and those who were yet to receive initial teacher education (M=2.96, SD=.86), t (166) =2.708, p<0.05. It is therefore likely that teachers who have received initial teacher education choose their CPD activities more selectively.

Simple linear regression was used to test if effectiveness of past CPD activities predicted the perceived impact of the CPD activities. The results showed that an increase in the effectiveness of past CPD activities resulted in increased perceived impact, and that average effectiveness explained 33.1% of the variance in perceived impact (R^2=.335, F (1,166) =83.78, p<0.001). It was found that average effectiveness significantly predicted perceived impact (β =.58, p<0.001). Table 26 provides a summary of the regression analysis.

Table 26: *Regression analysis summary for CPD effectiveness predicting CPD impact*

Variable	B	95% CI	β	t	p
(Constant)	1.409	[0.98, 1.8]		6.335	<0.001
Avg. Effectiveness	0.596	[0.47, 0.72]	0.579	9.153	<0.001

Note: R^2 adjusted = 0.331. CI = Confidence interval for B

In summary: $Perceived\ impact = 1.41 + 0.6 \times Average\ Effectiveness$

To further assess the variables on effectiveness and outcomes of TVET teacher CPD in Kenya, cluster analysis was carried out on both sets of variables. As recommend by Gore (2000) hierarchical cluster analysis was first carried out to identify the most likely number of clusters after which K-means clustering was conducted. From the hierarchical cluster analysis, different sets of clusters were compared to identify the number of clusters that best explained the observed variability in the variables. The clusters were identified by studying the agglomeration schedule for large jumps in the coefficients (large jumps in the coefficient reflect the joining of dissimilar clusters) as well as the rescaled cluster distances in the dendrogram. Figure 10 shows the dendrogram obtained using hierarchical clustering of the outcomes of past teacher CPD activities using the Ward Method with Euclidian distances on SPSS version 24. At the rescaled distance value of slightly above 15, three clusters were identified, which are highlighted for clarity. To ensure that the results were not a feature of the method adopted, hierarchical clustering using the average method and Pearson's similarity matrix was done, resulting in a similar dendrogram and cluster solution.

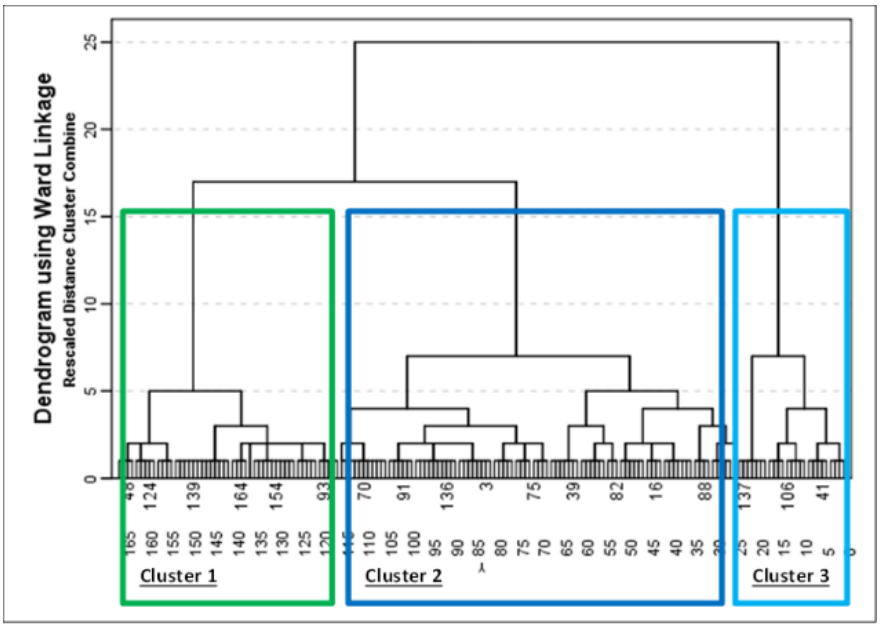
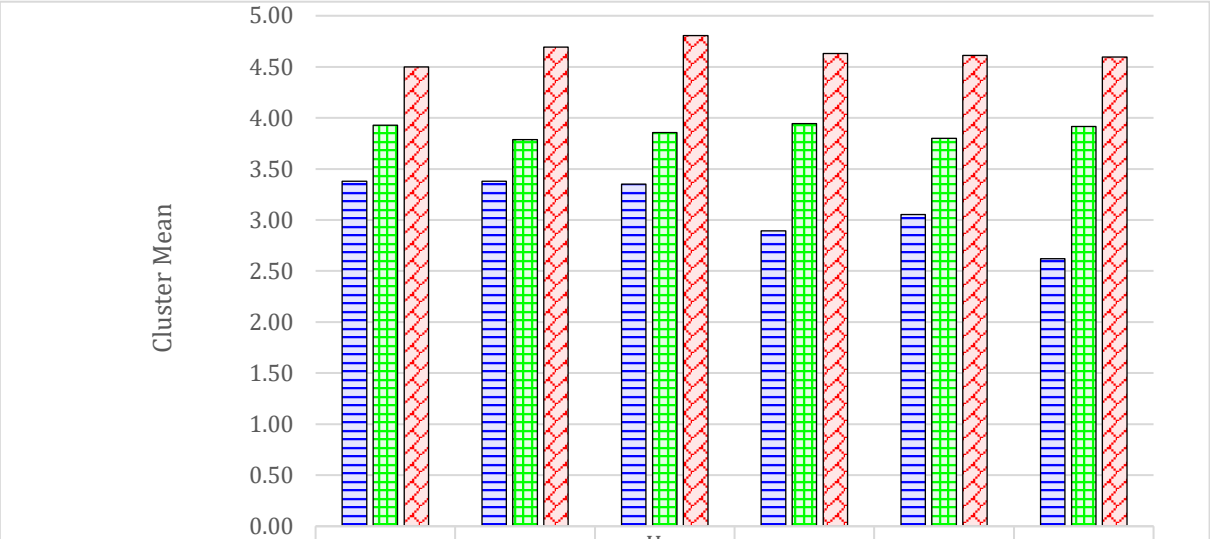


Figure 10: *Dendrogram, outcomes of CPD activities hierarchical cluster analysis*

Based on this result, K-means clustering was done, setting the desired number of clusters to three. The F-Tests for the clusters showed that collaborating with other teachers had the highest F-value (147.015) showing that it contributed most to the formation of the clusters. The means of the three clusters are shown in Figure 11.

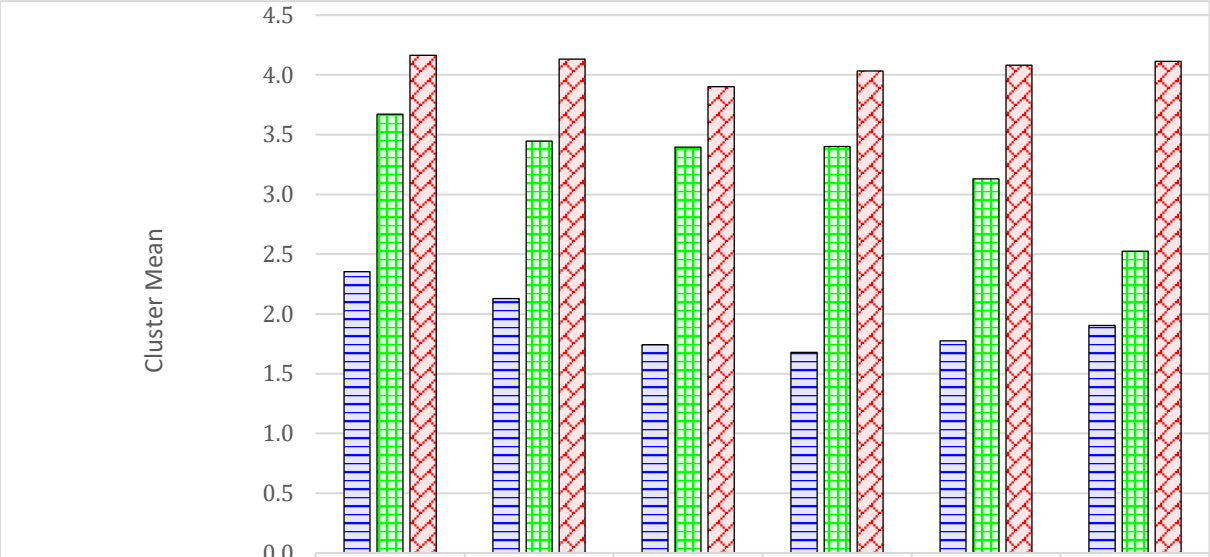


	Updating Content	Providing Demonstrations	Use different teaching mtds	Better classroom mgt.	Better student assesment	Collaborate more
Cluster1 (N = 37) Mean:	3.38	3.38	3.35	2.89	3.05	2.62
Cluster 2 (N = 70) Mean:	3.93	3.79	3.86	3.94	3.80	3.91
Cluster 3 (N = 62) Mean:	4.50	4.69	4.81	4.63	4.61	4.60

Figure 11: *Teacher CPD outcomes cluster means*

Participants in the first cluster reported relatively low impact on all the five evaluation measures and therefore consists of teachers whose past CPD activities had not led to significant changes in their teaching practices. On the other hand, participants in the third cluster reported strong impact across all five evaluation measures. The cluster therefore consists of teachers whose past CPD activities were perceived as impactful. The second cluster consists of teachers whose CPD activities have had average impact. Analysis of the categories based on different teacher characteristics (e.g., prior educational qualifications, career stage etc) did not reveal distinct profiles of the teachers in the categories.

Similar analysis was conducted on the perceived effectiveness of past CPD activities. From the hierarchical and k-means cluster analysis of the effectiveness of past teacher CPD activities, three clusters were identified, whose means are shown in Figure 12 (for brevity the dendrogram was omitted).



	Relevant Content	Coherent content	Group of teachers	Active and interactive learning	Collaborative learning	Sufficient duration
Cluster 1 (N=31) Mean:	2.4	2.1	1.7	1.7	1.8	1.9
Cluster 2 (N =78) Mean:	3.7	3.4	3.4	3.4	3.1	2.5
Cluster 3 (N = 61) Mean:	4.2	4.1	3.9	4.0	4.1	4.1

Figure 12: *Effectiveness of past CPD activities cluster means*

The first cluster has relatively low means and consists of teachers whose past CPD activities rarely featured the characteristics of effective teacher CPD. The third cluster has relatively high means for all the activities, and therefore consists of teachers whose CPD activities could be characterized as relatively effective. The second cluster consists of teachers whose past CPD activities had some of the characteristics that suggest effectiveness. Analysis of the categories based on different teacher characteristics (e.g., prior educational qualifications, career stage etc) did not reveal distinct profiles of the teachers in the categories.

7.4 Research question 5: Motives, challenges and institutional practices influencing TVET teacher CPD in Kenya

The fifth research question focused on the motives that guide TVET teacher CPD practices in Kenya, as well as the cost and challenges associated with CPD. Related to these are the benefits that teachers actually receive from their CPD and the contextual factors that moderate the motives, costs and benefits associated with teacher CPD.

7.4.1 Aims and motives for teacher CPD

From the theoretical framework, teacher CPD is a goal directed activity, with teachers having multiple motives and reasons for participating in teacher CPD. To assess the veracity of this claim, participating teachers were asked to identify and evaluate how strongly different motives motivate their participation in CPD. As expected, participating teachers reported multiple motives for participating in CPD.

The motive that motivates teachers most strongly is better student performance with a mean rating of 4.35, and a majority of the respondents, i.e., 92 %, indicating that better student performance motivated them highly or very highly.

In agreement with the finding reported earlier that TVET teachers in Kenya are more likely to seek non-pecuniary benefits from their CPD, the second and third strongest motivators are personal satisfaction and improved teaching skills. Moreover, and in agreement with the finding that TVET teachers in Kenya view CPD as a means to develop their subject content knowledge, 84 % of the respondents indicated that this motive motivates them highly or very highly.

In contrast to these motives, the weakest and least common motive is leaving the profession with a mean rating of 2.91, with a significant 41% of the respondents indicating that leaving the profession was not a motive. Table 27 shows the different motives and their respective ratings by the respondents.

Table 27: *Motivation for CPD*

Motivation for CPD	None/Small (%)	Moderate (%)	High/V. High (%)	Mean
Better student performance	2	6	92	4.35
Personal satisfaction	1	13	86	4.26
Improve my teaching skills	2	9	89	4.24
Improve my subject knowledge	2	14	84	4.2
Career progress(e.g. promotion)	3	20	77	4.13
Career change (leave teaching)	41	23	36	2.91

During the interviews, participants revealed that teachers seek to participate in formal CPD with the hope of getting promotions and pay rises, although after some time, many teachers feel that their employer is slow in rewarding them for the time and effort they spend in getting higher educational qualifications. For some teachers, especially those in

their late career stages, formal CPD is seen as way out of monotony and boredom, while others seek it to prepare for post-retirement life.

To get a better picture of how the different motives motivate and influence TVET teacher CPD practices in Kenya, further analysis was done on both the interview data and the survey data. From an analysis of the codes relating to motivation for teacher CPD, four code categories relating to motives for participating in teacher CPD were identified. The codes and their categories are shown in Table 28. For purposes of brevity, some codes have been omitted.

Table 28: *Motives for teacher CPD and their categories*

Codes	Category
Avoid stagnation and boredom Rejuvenation, break from monotony Regeneration	CPD for Rejuvenation
CPD due to regulatory and administrative demands CPD related to and supportive of non-teaching responsibility CPD as something the government uses to meets its goals	CPD as a Requirement
Get better work e.g., teach at a university Attain higher levels of influence Prepare for post-retirement life and work Search for and maintenance of status Improve life situation for self and family Promotion, higher pay, better opportunities	CPD for Status and Authority
Improve teaching skills and content delivery Research, to a solve problem Keep up to date with work and industry practices Adapt to curricular changes Desire to impact positively on students Increase confidence	CPD for Task Performance Competence

*7.4.1.1 **Motivational orientations***

Consequent analysis focused on explaining the categories of motives that emerged from the codes and identifying the CPD practices that align with those motives and the teachers most likely to adopt those motives. The analysis involved comparing the motives stated with the profiles of the teachers and the CPD practices used by the teachers. In line with the theoretical framework, teacher CPD practices were taken to consist of the content learnt, learning methods, and timing for learning. The analysis resulted in a matrix of motivational orientations as shown in Table 29.

Table 29: *TVET Teacher CPD Orientations*

Orientation	**Description** (Why, when, how, what, and by who)				
	Motivation (Why)	Timing (When)	Learning Methods (How)	Content (What to Learn)	Teacher Characteristics (Who)
CPD for task performance competence	-Search for performance competence -Solve a specific problem related to various teacher roles	- When a problem is identified	-Embedded learning methods; -Information search, -Use of media, -Professional dialogue	-Content specific to the problem, or desired competence -Subject content knowledge -Teaching methods	-All teachers, -Majority may be ECS teachers seeking competence
CPD for status and authority	-Search for status and authority -Prepare for more senior/authoritative positions	-Strategic timing in response to identified opportunities -Ability to self-finance	-Formal learning methods, e.g., University courses -Certification programs	-Content of the courses enrolled in	- All teachers, - ECS and MCS teachers are the majority
CPD for rejuvenation and renewal	-Need for renewal, break from monotony -Solve/avoid boredom and burnout -Self-challenge	-When teachers feel the need to take a break, -Ability to finance - Availability of opportunity	- Post-graduate courses - Industrial attachment for lectures	-Content of the program enrolled in -Challenging & novel content not usually encountered	-Majority are LCS teacher
CPD as a requirement	-Meet mandated staff development requirements -Attend staff development programmes sponsored by the employer	-Timing dictated by the employer e.g., availability of funding for staff development -Ability to self-finance	-As stipulated by the requirement, -Usually seminars, workshop and short-training courses	-Content set by program sponsor -Content related to role of those selected, e.g., management skills for teachers in with administrative roles	-As selected by the employer, -Those required to attended mandated staff development programs

- The depictions are typical and not exhaustive

Each orientation could be described in terms of motives, i.e., reasons, why teachers participate in CPD, and in reference to the motives, the content learnt and learning methods adopted, the timing for CPD, and teacher characteristics associated with that motive. The orientations are thus sets of reasons why teachers participate in CPD, the CPD practices teachers are most likely to adopt given those reasons, and the teachers most likely to adopt those reasons and practices. The four orientations are CPD for task performance, CPD for status and authority, CPD for rejuvenation and renewal, and CPD as a regulatory requirement. The orientations are further described below.

Teacher CPD for Task Performance Competence

From the interviews, it is clear that teachers place importance on being able to teach well and help students pass their examinations. The interviewees often used the term "delivery skills" to mean having both content mastery and being able to present the content to students in a way that students could understand.

MuTTi_2:

> *My motivation to pursue these? I think for me, delivery marks everything.*

Accordingly, a key reason for engaging in teacher CPD was to improve "delivery skills", i.e., having mastery of content and being able to present the content to students in a way that students could understand. Improving delivery skills was associated with taking time to learn the relevant content. Identified this way, teacher CPD takes the form of "information search", where information needed to execute a task is identified and then "learnt".

MuTTi_3:

> *Yes, in updating their skills….in fact, we can say they are teachers, but they are doing some form of apprenticeship, learning on the job. You find new materials that you had not learnt in the university, you go and study it, nowadays on the internet, and then you know how to do it. Isn't it? You learn on the job.*

Learning thus is focused on acquiring detailed information about something that has direct relevance to the tasks and challenges faced. Content can be learnt by visiting the library and reading books or searching for content online. With respect to improving teaching practices and methods, or dealing with students' conceptual difficulties,

teachers often engage in dialogue with other teachers. Teachers also search for needed information on the internet or watch YouTube videos.

CPD for Task Performance Competence is not limited to the tasks of teaching, but all the roles that teachers take part in. Teacher CPD may be sought for a variety of performances. For example, a teacher working as an administrator may seek training on financial management, or a guidance and counselling teacher may learn how to detect addiction, or a games master may learn First-Aid skills. In all these cases, teacher CPD is motivated by the desire to better perform both teaching and non-teaching roles. Accordingly, such CPD or its effectiveness may thus go undetected in traditional evaluations that focus on student learning outcomes or evaluations that use improved test results to determine the effectiveness of teacher CPD.

Teacher CPD for Status and Authority

While attaining Task Performance Competence is an important motivator, it is not the only motivator. One teacher put it succinctly:

MuTTi_1:

> *Ideally from experience……we do not go for Masters to make students get passes in the national examinations. That is a lie.*

Participants frequently stated that they use their CPD as a way to get externally awarded benefits such as promotions or get appointed into administrative positions. One teacher saw CPD as her way to get promoted and use her knowledge which she felt was under-utilized in class:

NbTTi_2:

> *Yeah, by doing more research, apart from personal satisfaction, it will help me improve, to be exposed more and get promotions, maybe at a managerial level where I can also influence and implement what I am learning.*

Another teacher saw teacher CPD as way to open up opportunities for her:

McTTi_2:

> *Because you would want to improve. To improve and become a better person, maybe, expand your options.... I do not want to be limited to this place….as I*

said, I am open to opportunities. If something opens up, I should be able to take it up; I should have the relevant knowledge and experience.

The dialogue below captures the use of CPD as a way to attain authority and status within the administrative hierarchy:

MuTTi_3:

The other motivation is, like the leadership courses, is to aspire to management; to grow into management. Like the course in senior management. I sponsored myself from my pocket when I realized that every leader in public service is required to have that course. I just took it and paid for myself.

Interviewer:

Had you been appointed as a leader at that point?

MuTTi_3:

No. I was just aspiring, so that when I write my CV, I include it as part of this.

In these cases, teachers participate in CPD to establish authority and attain higher levels of influence. The motivational orientation was therefore labelled as the CPD for Status and Authority. As a ladder to status and authority teacher CPD works: by enabling the teacher to demonstrate, in a more-or-less formal and defensible way, that one has the relevant knowledge and experience to take up that opportunity. In this orientation, teachers are more likely to use formal academic learning activities that lead to formal qualifications that are well recognized such as a Bachelor's Degree or a Master's Degree. Others may seek professional training in their area of specialization to get certified as competent.

Similar to the cases described above, teachers may use CPD to secure positions they have been appointed to:

MuTTi_2:

Sometimes even if you perform after you have been appointed into an office, that is when you say, let me go and add my education, because if you are there and you are not qualified, chances of you being plucked out are so high.

Teachers without formal teacher training feel insecure about their jobs and therefore enrol for teacher training courses to secure their employment. As such, teacher CPD becomes a means to secure their jobs and to bolster their confidence and status:

McTTi_1:

> *You feel that when you underwent pedagogical training, that is when you could comfortably call yourself a professional teacher….because even the terms of employment also improved……But before, you were only stagnating in one position. And actually, you were being called an untrained graduate.*

MuTTi_1:

> *When I left KTTC as a teacher and started teaching, I felt that I did not have the courage to deal with diploma students when I was still a diploma holder. And that is what made me go for the next level.*

Teacher CPD for Rejuvenation and Renewal

Several Late Career Stage interviewees indicated that they participated in CPD to feel alive, get challenged, meet new people, and possibly get into new opportunities. The dialogue below with a teacher who had recently obtained a PhD degree shows this use of CPD to get relief from routine:

McTTi_1:

> *You find that for example, I have been teaching for a long time. I cannot say there is any new content I learn. You feel like that after teaching something for quite long. I was teaching mathematics, I stayed there for over 18 years.*
> *But why I went to do my masters, [in teaching] I was learning nothing new. It was the same thing all the time, there are no new things. It is like I got bored.*
> *Yeah, I had to see, why not advance.*

One teacher, who had worked for sixteen years, saw Lecturer Industrial Attachment as providing a useful break from teaching and interacting with the theoretical content she teaches:

KbTTi_2:

> *But I feel I need a break from teaching, and go and study as a way to get a break. You know you teach and teach and teach, and finally you feel like you*

need a break. In fact, I wanted to just go for attachment for three months as a break. I really wanted to go. You feel that you want to go out to industry and relieve your mind from all the theory.

Late-stage career teachers are more likely to participate in CPD for rejuvenation; they are the ones most likely to feel tired of their teaching routine and its monotony. They also have less hope of being promoted to administrative positions. They may also use the CPD as a way to build a more interesting life after they leave teaching. The learning strategy most likely to be adopted is a university programme that is likely to present new content. In this case teachers are willing to spend money even when it is clear that they are unlikely to receive pecuniary benefits from their CPD.

Teacher CPD as a Requirement

The fourth orientation that emerged from the interviews is when teachers participate in CPD as a response to the demands made on them by administrators and the government. For example, teachers with non-teaching responsibilities are mandated to attend various trainings:

NbTTi_1:

We are required to take some units related to administration and governance, and even any promotion might be based on that particular line. You must take a unit from the school of government related to administration and management. For example, the course on anti-corruption, ethics and integrity, those are relevant only because of my non-teaching responsibility. And I take this as opposed to someone else who doesn't have a responsibility.

Some government supported CPD programs have focused on ensuring that the government attains its policy goals. But teachers feel that the government is using teachers' CPD to achieve its own policy goals, in this case to make TVET more appealing to the public.

McTTi_3:

That might be one of the reasons, but also with the current dynamics in TVET, they also want to upgrade the status of the trainer…it was part of streamlining…to streamline TVET and make it appealing.

Since the focus of the government is make teachers appear more authoritative and qualified, the focus of these programs has consequently focused on demonstrable qualifications obtained from universities and other formal training institutions.

McTTi_3:

> *I would like to correct, that there was a government initiative about two years ago, where all diploma teachers had been sponsored to go and take their degrees. But only in key areas like engineering. So that you find someone has been forwarded to go and do a degree.*

The above suggests that teachers participated in the CPD activities largely because they had to. As such, they adopted the learning methods and content chosen for them. In this dimension teacher CPD seeks to comply with external requirements or to attain externally set goals and policy objectives. Teachers thus choose learning activities which can easily be reported to evidence having met the requirements. In case the learning activities are not sponsored, teachers will choose learning activities which do not necessarily require them to pay tuition or participation fees.

*7.4.1.2 **Factor analysis on motives for teacher CPD***

The findings from the interviews, lead to the view that the motives identified in literature and assessed in the survey constituted more general motives. Thus, the motives surveyed in the questionnaire survey were correlated to each other. The correlation pattern is shown in Table 30.

Table 30: *Correlation of motives for teacher CPD*

		a	b	c	d	e	f
a	Improve my teaching skills	-					
b	Improve my subject knowledge	.828**	-				
c	Better student performance	.548**	.444**	-			
d	Career progress(e.g. promotion)	.202**	.254**	.312**	-		
e	Career change (leave teaching)	0.094	0.104	0.137	.311**	-	
f	Personal satisfaction	.411**	.402**	.383**	.359**	.161*	-

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The pattern of correlations showed that the motives co-occur and therefore likely relate to a smaller set of factors. For example, improving teaching skills, subject knowledge and student performance likely constitute one factor, while career progress and career

change constitute another factor. To test this possibility, factor analysis was carried out. Despite the small set of variables, they were factorable: The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.69, while the Bartlett's test of sphericity was significant ($\chi^2(15) = 341$, $p < 0.001$). Principle component analysis identified two factors with Eigen value greater than one, i.e., 2.77 and 1.17, and explaining 46% and 20% of the variance respectively. The resulting factor loadings and communalities are shown in Table 31.

Table 31: *Rotated component matrix for TVET teacher CPD motives*

	Component		Communality
	CPD for task-performance	CPD for status and authority	
Improve my teaching skills	.924	.005	0.85
Improve my subject knowledge	.888	.038	0.79
Better student performance	.696	.236	0.54
Personal satisfaction	*.565*	*.397*	0.63
Career change (leave teaching)	-.024	.805	0.65
Career progress(e.g. promotion)	.248	.757	0.48

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Two distinct factors were thus identified. Factor one, consists of the first three motives: improve teaching skills, improve subject knowledge, and better student performance. These motives fall squarely within the CPD for task performance orientation identified earlier. The second factor, consisting of the career progress and career change motives aligns with the "CPD for Status and Authority" orientation. Perhaps owing to the low number of variables, it was not possible to extract a third factor relating to the CPD for Rejuvenation and Renewal. Moreover, the personal satisfaction variable cross-loads on both the extracted factors and has a large communality. Since both career progress and developing task-performance potentially contribute to personal satisfaction, the variable likely measures important aspects of the motivation for teacher CPD which need to be clarified and separated. The means of the four motives are shown in Table 32.

Table 32: *Descriptive statistics for teacher CPD motives*

	Mean (SD)	Skewness	Kurtosis
CPD for task competence	4.26 (0.64)	-.653	.359
Personal satisfaction	4.26 (0.74)	-.903	1.284
Career progress(e.g. promotion)	4.13 (0.88)	-.847	.581
Career change (leave teaching)	2.91 (1.36)	.058	-1.184

To further test the results, the means of the four motives were above were compared for different categories of teachers. Teachers were categorized by such characteristics as gender, career stage, non-teaching responsibilities, teaching area, and prior. While the means of the four motives above differed across different categories of teachers, the differences were not statistically significant. It was therefore not possible to draw firm conclusions as to which group of teachers is more likely to be motivated by a given motive. Further quantitative research to test the model is therefore warranted.

7.4.2 Challenges and barrier to TVET teacher CPD

To investigate the challenges and barriers to TVET teacher CPD in Kenya, participants were asked to indicate the extent to which various challenges limit their professional development. Majority of the respondents indicated that they were most strongly challenged by the costs associated with teacher CPD. Other challenges identified as strong or very strong challenges are lack of time due to heavy teaching work-loads and lack of employer support. The least common challenge was feeling too old to participate. Teachers also appear to have relatively good access to CPD opportunities and ICT facilities, with nearly 60% of the respondents indicating that lack of these is only a minor challenge. Figure 13 graphically shows how strongly each challenge was rated by the participants. For example, 76.8% of the participants felt that cost is a strong challenge while only 14.3% of the participants felt that lack of prerequisites is a strong challenge.

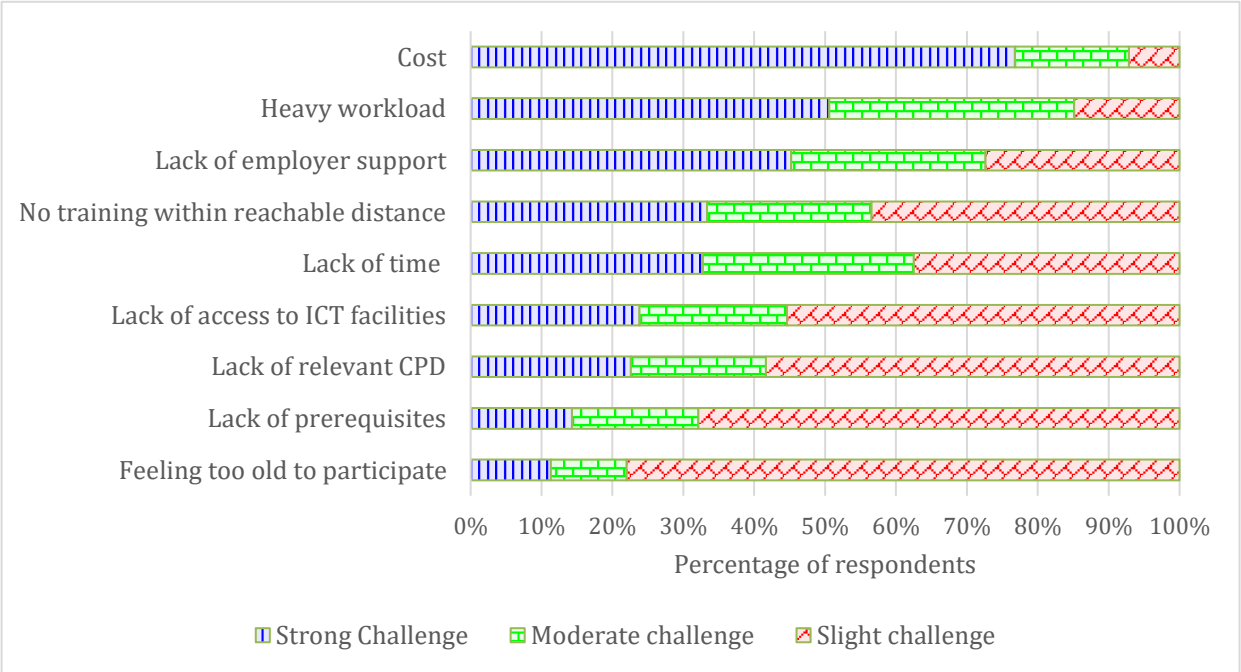


Figure 13: *Challenges to Teacher CPD*

To assess if the challenges co-occur, the variables were correlated with each other. Almost all the challenges correlated with each other significantly, see Table 33. The finding shows that teachers face multiple challenges concurrently. Thus, in offering support, a multipronged approach is required.

Table 33: *Correlation matrix for challenges*

		a	b	c	d	e	f	g	h	i
a	Cost, it is too expensive	-								
b	Workload, I have too much work here at the institute	.450**	-							
c	Lack of time due to family obligations	.347**	.462**	-						
d	Lack of employer support	.332**	.478**	.499**	-					
e	Lack of prerequisite qualifications and experience	0.018	.270**	.396**	.239**	-				
f	No relevant professional development is offered	0.112	.364**	.324**	.315**	.500**	-			
g	Lack of access to necessary ICT facilities	0.024	.337**	.346**	.362**	.447**	.569**	-		
h	No training within reachable distance	.186*	.350**	.270**	.313**	.343**	.467**	.542**	-	
i	Feeling too old to participate	0.056	0.083	.311**	.178*	.440**	.341**	.389**	.274**	-

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 33 shows that many of the challenges are correlated with each other, suggesting that the above challenges reflect a smaller set of common underlying challenges. To verify this hypothesis, factor analysis was carried out. The factorability of the nine items was satisfied: the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.822, well above the recommended 0.6, and the Bartlett's test of sphericity was significant ($\chi^2(36) = 460$, $p < 0.001$). Principal component analysis was therefore carried out. The first two factors had initial eigen values of 3.685 and 1.476 and explained 41% and 16.4% of the variance respectively. The third factor had an initial eigen very close to one, i.e., 09, and explained 9.6 percent of the variance. Since the three factors resembled previous theoretical models and the eigen values levelled off on the scree-plot after the third factor, a three-factor solution, explaining 67% of the variance was selected. The resulting factor loadings, i.e., rotated component matrix, and the communalities are

shown in Table 34. Apart from cost, all the variables have a communality greater than 0.6.

Table 34: *Rotated Component Matrix: Challenges to TVET teacher CPD*

	Factor			
Challenge	Lack of access & opportunity	Systemic restrictions	*Personal difficulties*	Communality
No training within reachable distance	0.798	0.197	0.051	0.656
Lack of access to necessary ICT facilities	0.778	0.101	0.323	0.685
No relevant professional development is offered	0.725	0.149	0.320	0.706
Cost, it is too expensive	-0.060	0.805	-0.062	0.562
Workload, I have too much work here at the institute	0.384	0.732	-0.016	0.642
Lack of employer support	0.284	0.673	0.167	0.649
Lack of time due to family obligations	0.103	0.658	0.512	0.721
Feeling too old to participate	0.152	0.016	*0.839*	0.679
Lack of prerequisite qualifications and experience	0.403	0.085	*0.687*	0.727

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

The first factor relates to the lack of opportunity and access. Participants experiencing this challenge thus indicated that they do not find relevant professional development. In the alternative, what is offered is beyond their reachable distance, or demands the use of ICT facilities that they do not have. This is likely where a teacher lives or works in rural area far from major towns where infrastructure and learning resources can be more easily accessed.

The second factor relates to systemic factors that hinder learning. Thus, even when a learning opportunity is available, teachers may nonetheless be unable to participate due to hindrances such as lack of money to pay for tuition, travel, and accommodation; lack of time to utilize the opportunity due to heavy workload and family obligations, or failure by the employer to allow the teacher take up the opportunity. This factor therefore relates to the restrictions teachers face when they wish to take up a learning opportunity.

While the second factor relates to external barriers, teachers may face difficulties and barriers that are specific to the person. Thus, these barriers relate to the self-evaluation of the teacher as either lacking in pre-requisites or feeling too old to participate. It is worth noting that lack of time due to family obligations cross-loads with systemic restrictions and personal difficulties. Since the variable is relatively unique from the other variables, and it has a relatively large communality, it was not removed from the list of the variables. It is likely that the variable is important but was interpreted differently by the respondents. Future studies to explore this aspect are therefore called for.

After identifying the factors, composite scores for each of the factors were computed. The scores were based on the means of the primary variables loading on to each factor. Systemic restrictions, having the largest mean, were found to be the most common and strongly felt challenges. The composite scores are shown in Table 35.

Table 35: *Descriptive statistics for the three barriers to TVET teacher CPD*

	No. of items	Mean (SD)	Skewness	Kurtosis	Cronbach's Alpha
Lack of access & opportunity	3	2.49 (1.13)	.253	-1.14	.77
Systemic restrictions	4	3.44 (.85)	-.391	-.216	.75
Personal difficulties	2	1.89 (1.01)	1.019	.243	.61

The means of the three variables were then compared for different categories of teachers. T-tests showed that, compared to female teachers (M=3.20, SD=.97), male teachers (M=3.56, SD=.76) appear to experience systemic barriers more strongly, $t(166)=2.58$, $p<0.05$. Systemic barriers also affect teachers with dependents (M=3.56, SD=.79) more strongly than those without (M=3.09, SD=.94), $t(166) = 3.13$, $p<0.005$).

ANOVA tests were also conducted to test the effect of career stage on the strength of the challenges. Results showed significant differences in the means of the perceived strength of personal difficulties [$F(2, 165)=4.13$, $p<0.05$]. Tukey's HSD post-hoc test showed that Late Career Stage teachers (M=2.25, SD=1.02, N=34) experience personal difficulties more strongly compared to their Early Career Stage teachers (M=1.67, SD=.87, N=71). With respect to non-teaching responsibilities, statistically significant differences were also found in the means of the perceived strength of systemic barriers [$F(2,165)=4.82$, $p<0.05$]. Tukey's HSD post hoc tests showed that teachers with

administrative responsibilities (*M*=, 3.56, *SD*=.76, *N*=45) reported significantly higher systemic barriers compared to those without non-teaching responsibilities (*M*=3.133, *SD*= 1.02, *N*=48). When similar comparisons were done with respect to marital status, location where the teachers work, and the job-group of the teachers, the differences in means were not statistically significant.

The survey findings above were corroborated by the interviews. Costs associated with learning, lack of time, and family obligations featured frequently in the interviews:

MuTTi_1:

> *Costs is challenge, I had to privately pay. One of the things that has stopped me from finishing my masters is also time. There is no time. Teachers really struggle with the issue of time.*

ThTTi_2:

> *… finding time can be a challenge… It is a big sacrifice. My children are still young, and so during that time, I really strained. I had to get someone to come and take care of the children.*

Other than lack of time due to school and family obligations, the squeezed school calendar was also identified as a contributing factor to the lack for time for CPD. In this case the lack of a longer school break means teachers do not have time to engage in learning activities that should take place over several weeks. The excerpt below demonstrates the lack of time due to the school calendar.

MaTTi_2:

> *In our programmes, teachers are never free. Because it is January to April, and then a short break of two weeks, during which teachers are expected to mark their student examinations, and make preparations for the next term. So that is a contributor towards that.*

KbTTi_1:

> *The [school] calendar should be streamlined so that there is time for professional development and then one should get financial support.*

*7.4.2.1 **Costs and financing of TVET teacher CPD***

Asked to rate the kind of costs that they face with their CPD, tuition and buying of learning materials were rated as the most significant costs faced by a majority of teachers. Transport and accommodation costs were also rated as significant by a majority of the teachers. Results are summarized in Table 36. The significance of tuition costs and buying of learning materials may be attributed to the view that CPD is only legitimate CPD when it is formal.

Table 36: *Costs associated with TVET teacher CPD*

Costs of CPD	None/ Small (%)	Moderate (%)	High/ V. High (%)	Mean
Tuition Fees	11.3	13.1	75.6	3.90
Attendance and participation fees	14.4	28.1	57.5	3.56
Transport and accommodation fees	10.1	25.6	64.3	3.73
Buying learning materials	14.3	19.6	66.1	3.71
Time away from my work	21.4	26.8	51.8	3.40
Time away from my family	16.7	26.8	56.5	3.56

The interviews corroborated the survey data, with some interview participants showing that the cost-burden is heavier for different categories of teachers. In one case, one teacher explained how a low job-group works to hinder the professional development of teachers. The vignette below illustrates this issue:

MaTTi_2:

> *Because if today you are going for masters, you need money. And if you are not in a position, say you stagnated in a lower job group; you might not be able to raise the funds.*

Interviewer:

> *You find that teachers who have overstayed in one job-group may not be able to afford advancing their education and this in a way completely hinders them?*

MaTTi_2:

> *Yes. A number are in that situation. That has happened to number of trainers. People have stagnated, age is an issue. … So, if someone has stagnated to [Job Group] K, and you are asking him for 150 000 [Ksh], I think that person will give up. It will be impossible.*

Another teacher provided a more concrete example of how TVET teachers are unable to finance their professional development:

KbTTi_1:

> *This is one of the items which is also a challenge, because, any professional development activity involves costs. For instance, even our pedagogical course, we have to pay 35 000 [Ksh], and we have 3 sessions for the three modules. That is more than 100 000 [Ksh], which you do not have immediately, or especially if you have a loan. But even without a running loan, at job group K, raising this money is difficult. The money you get is just enough to sustain you and do something small, and then you have nothing left. Cost is a very big challenge.*

Another teacher showed how a teacher's job-group and their career stage interact to influence their participation choices:

ThTTi_2:

> *Ok, concerning the job group. It motivates us to study. You know, finally, your pension is based on your job group and the chances of getting a higher job group [are higher] when you study further.*
>
> *On the other hand, there is also the question of maybe you have less than ten years to study and work, or less [before retiring]. So, you would rather concentrate on something more assured, your side hustle that you can retire on. Yeah, that becomes your pension.*

Late Career Stage teachers are thus less likely to seek formal CPD owing to lower expected returns. They lack the advantage of time and are less likely to recover their investments in education. In contrast, while Early Career Stage teachers have a more assured chance of recovering their investment in education, they often lack the resources to invest owing to their lower earnings and spending ability. A paradox thus lies in the fact that while younger teachers have a greater incentive to participate in CPD, they lack the resources to do so, while their older colleagues find fewer incentives but have the resources to participate in CPD.

*7.4.2.2 **Family and TVET teacher CPD***

Several interview participants indicated that they have had to forego, or at least defer, their CPD because the CPD activities were demanding too much time, and given their family situation, they were unable to avail themselves for the CPD. However, this challenge was felt more acutely by women.

MuTTi_2:

> *But I think for ladies, they are more affected. For a gent[sic], you feel that your wife is there; you can go for studies and feel that everything is handled. But for a lady, for you to be able to leave your kids, to leave your husband and say that I am studying right now, that is a bit hard. It is going to be a challenge.*

Social and cultural systems grant men more liberties and therefore men have better access to opportunities than women. In this case, it is socially permissible for a man to take time off for studies, or even leave the home to for studies, but this liberty is not equally available to women.

Similarly, family situations have also meant that some teachers could not raise the finances needed to pay for the desired CPD.

ThTTi_1:

> *Money is the issue. I had to cut down on my own personal things so that money could be available for the family and some could be available for funding the course.*

McTTi_3:

> *It was from my pocket and I had to juggle between school work and my reading time. It was not possible to get a study leave that I had anticipated. So it was both challenging and costly.*

Interviewer: *How did you deal with this? How did you meet the costs?*

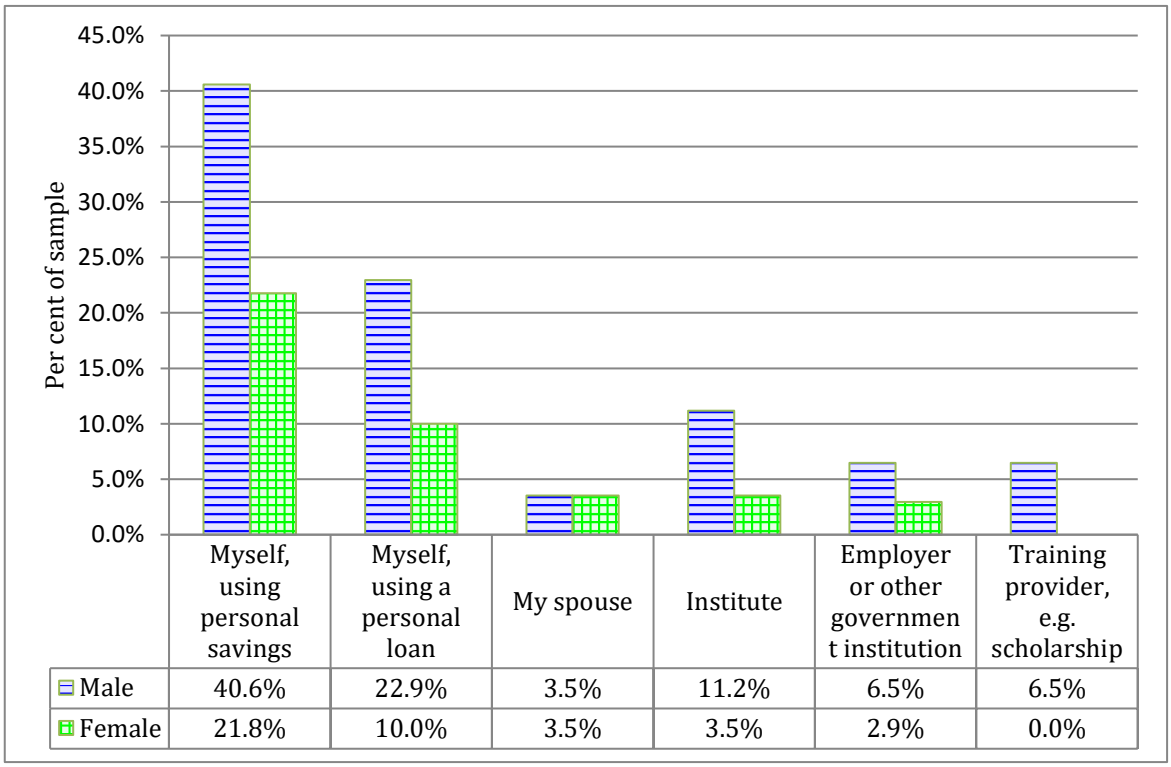
McTTi_3:

> *I saved, and I think at some point I got a HELB[Higher Education Loans Board] loan, a small portion, which I later paid back and finished.*

On the other hand, families are also influenced by teachers' CPD, and sometimes negatively so. For one teacher, the time away from home while attending a university course over the holidays led his family to break up. When the study was being designed, it was expected that families influence CPD. It was not expected that families would be the recipients of such drastic influences from teachers' CPD. Thus, the challenge of "no time for family" can result in severe and negative consequences on the teacher.

7.4.3 Financing of TVET teacher CPD

Asked how they finance their CPD, teachers indicated that they use different financing methods. Costs associated with CPD are mainly borne by the teachers, either through personal savings (63 per cent), personal loans (33 per cent) or support from spouse (7 per cent). Only in a few cases did the training provider (6.5 per cent) or the technical training institute meet the costs associated with teacher learning (15 per cent). See the Figure 14. The survey data agrees with the sentiments raised during the interviews that the institutes and the government provide little or no financing for CPD. It is also clear that female teachers are less likely to receive support from their institutes, employers, or training providers.



	Myself, using personal savings	Myself, using a personal loan	My spouse	Institute	Employer or other government institution	Training provider, e.g. scholarship
Male	40.6%	22.9%	3.5%	11.2%	6.5%	6.5%
Female	21.8%	10.0%	3.5%	3.5%	2.9%	0.0%

Figure 14: *Financing of CPD by TVET teachers*

7.4.3.1 ***Support for CPD***

Majority of the teachers wish to receive financial aid to support their CPD activities, with 83 per cent of the respondents indicating this is the support they need. This agrees with the earlier finding that teachers find the costs associated with their CPD as the biggest challenge to their professional learning. And in agreement with the finding that lack of time is a significant challenge, the second most desired form of support is to be allowed to go for study leave, with nearly three quarters of the respondents indicating that they have a strong need for such support. Further, and in agreement with the need for time off from school work to concentrate on learning, two thirds of the respondents desired days off to participate in CPD activities.

In agreement with the finding that heavy work-load hinders their CPD, 60% of the respondents wished for a reduction of their work-load as a way to support them in their CPD. Similarly, teachers also wished that a substitute teacher could handle their work as they attend their CPD activities. The administrations of the institutes and the teacher employer should develop policies that allocate time for teacher learning. Results are captured in Table 37.

Table 37: *Need for Support*

Need for support	Limited (%)	Moderate (%)	Significant (%)	Mean
Financial support to meet costs associated with professional learning activities	2.4	14.9	82.7	4.27
Reduction in workload	10.1	29.2	60.7	3.71
Substitute teacher for when I am away on professional learning activities	8.9	31.5	59.5	3.74
Days off to participate in professional learning	6.5	27.4	66.1	3.89
Study leave	7.7	18.5	73.8	4.11

These responses agree with the responses from the interviews. Interviewed teachers indicated that there lacks a framework to support teachers when they are away on CPD, such that one is still expected to teach while participating in CPD activities. This results in conflicting schedules and disagreements with administrators.

Other participants pointed out that in the absence of a clear framework to support teachers; they experience frustrations even when support could otherwise be available. The vignette below highlights some of these difficulties:

NbTTi_2:

> *The issue of money, you just take your own … the conference will end before you can get facilitated.*

Clearly, even in cases where financing may be available, the process of getting financed is long drawn and keeps teachers away from seeking financing. It is therefore not a wonder that teachers feel unsupported by their administrators.

Thus, when asked the extent to which they feel supported in their CPD, a significant portion of the respondents (20 %) felt their school administration and employer are unsupportive, suggesting the need to refine policies on how to support teachers in their CPD. In contrast, teachers rated their families as being very supportive, with more than 50 per cent of the respondents indicating that their families very supportive. Colleagues were also deemed as fairly supportive. The rest of the results are captured in Table 38.

Table 38: *Sources of support*

Source of support	Unsupportive	Supportive	Very Supportive	Mean
Family members	6.5%	42.0%	51.5%	4.02
Colleagues	6.5%	64.5%	29.0%	3.75
School administration	14.8%	69.8%	15.4%	3.35
Employer	20.8%	65.5%	13.7%	3.21

7.4.4 Influence of the curriculum and national examinations on TVET teacher CPD

Survey participants were also polled on their opinion on the national examinations conducted by the Kenya National Examinations Council (KNEC). The survey participants were asked to indicate the extent to which they agree with the claims that the examinations are overly theoretical, lack sufficient practical content, and do not reflect technological changes.

While a half of the participants (51%) agreed with the view that KNEC examinations focus mainly on theoretical content, nearly half of the participants (48%) were of the view that KNEC examinations examine practical skills sufficiently. Thus, while a large proportion of the teachers feel that KNEC examinations tend to be theory oriented, teachers also feel that practical skills are more or less sufficiently examined. Opinion was similarly equally split as to whether KNEC examinations are regularly updated to reflect technological progress. The results are summarized in Table 39.

Table 39: *Views on KNEC examinations*

Statements	Agreement with Statement (%)			
	Disagree	Neutral	Agree	Mean
a) KNEC examinations focus mainly on theoretical content	33	16	51	3.31
b) KNEC examinations examine practical skills sufficiently	27	25	48	3.21
c) KNEC examinations are regularly updated to reflect technological progress	40	22	38	2.89

While the survey results above present a rather positive view of the exit examinations, interview participants presented a more critical view of what is examined and how it is examined. According to the interview participants, the examinations and curriculum guiding the examinations are heavy in theory, light in practical content, and out of sync with what is required in industry. Two teachers described the situation thus:

MaTTi_3:

> *We have the main exam body, the KNEC, but there is a disconnect between KNEC and industry; you get it. But people have no option, because almost all the courses in Kenya are examined by KNEC.*

MuTTi_1:

> *No. it doesn't reflect changes in the field. Tell me why a student is learning about carburettors today? Why are we still teaching students how carburettors work, yet none of the models in the road are using it? What is in the syllabus is completely out of date.*

Asked if teachers make a choice between teaching content that students will be examined on and teaching content deemed important even if such content is not examined, participants indicated that the examined content takes priority. One teacher emphasized that despite the wish to expose students to content known to be important and relevant, the content of the exit examinations guides what is taught:

McTTi_2:

> *Of course, you think about that, because you do not want to teach students content and then they fail. As much as you would like to expose them to content that you feel is important for them later, you are also guided by what KNEC tests, so that your students are not found off-guard.*

*7.4.4.1 **Examination oriented teaching practices***

The survey results reflected the above practices. Thus, with regard to the claims that TVET teachers in Kenya are examination oriented in their teaching and personal learning, a significant three quarters (77%) of the participants agreed with the statement that they teach content most likely to be examined. Moreover, two thirds of the participants (63%) agreed with the view that they choose to learn content most likely to help their students pass in their examinations. However, the survey participants generally disagreed with the claims that they rarely teach practical content or that they do not learn practical skills. The results are summarized in Table 40

Table 40: *Views on teaching and learning practices*

Statements	Agreement with Statement (%)			
	Disagree	Neutral	Agree	Mean
a) I teach content that is most likely to be examined	10	13	77	3.85
b) I choose to learn knowledge most likely to help my students pass	24	13	63	3.48
c) I rarely teach practical skills	66	13	21	2.30
d) I do not learn practical skills	82	8	10	1.89

To explain these views, interview participants pointed out that how well students perform in the KNEC examinations constitutes a primary consideration for teachers and the training institutions:

MuTTi_3:

We draw a structure to win, and winning is passing exams.

And as one teacher emphatically put it, when students pass, the teacher also passes:

MuTTi_1:

If a student passes, the teacher passes. End of story.

Thus, since a teacher's excellence is evaluated in terms of student passes, the goal of a teacher is to help students pass:

McTTi_3:

Most of the times, you are geared towards helping the students to pass.

Helping students to pass in their examinations often involves helping students learn and master what the examination system requires of them. Teachers thus teach to the exam:

MaTTi_2:

> *Today, the technical people are starting their exams, if you go round the colleges, you will find teachers will only teach what they expect in the exams. There will be a rush for that.*

This extends to the use of past examination papers to guide their teaching and personal learning:

McTTi_1:

> *We actually use the past papers. Because if you compare the past papers, you find that maybe for last year, and for this year, the exams are almost the same. The content is the same, almost the same questions. They are similar. So, there is that influence.*

ThTTi_3:

> *And also, with the KNEC exams, I can be able to tell, probably the chances of this or that question coming ...I can be able to tell the setting and the kind of questions that we are likely to get. That way, to me it becomes easier to make students pass.*

*7.4.4.2 **The formal and enacted curriculum***

The use of examinations to structure teaching and learning was found to influence the teaching and learning of practical content. The interviews revealed that diploma-level students had their practical skills and knowledge evaluated entirely using pen-and-paper tests. That is, instead of requiring students to carry out a task that would demonstrate competency, students are merely required to describe the process of executing the given task:

MaTTi_3:

> *With KNEC they give you a practical question that you are supposed to tackle theoretically and write an answer. For example, I will give someone a*

procedure of dismantling a carburettor, or the procedure of servicing the brakes. So, you are expected to read it, and be able to memorize and reproduce it during the exam. Because at diploma level, nobody comes to test you on practice, there is not practical exam at the diploma level, just theory.

As a result, teachers rarely teach practical content to diploma level students since practical skills are not evaluated in the national examinations. Participants further revealed that practical lessons are sometimes not time-tabled, while some teachers are reluctant to hold practical lessons:

MaTTi_2

And if go to a number of institutions, you will find that those students are not even timetabled for practical lessons. Because it is not examined.

NbTTi_1

For quite a number of years, there are teachers who have not seen the importance of even taking a practical based unit. You could even find as if practical units are only taken by so and so. The others do not bother with them, because they do not see the significance of the practical lessons. You can then not convince them otherwise, when the examination system focuses only on theory.

The reluctance to teach practical content by some vocational teachers has been observed before. In their study, Ronoh et al. (2013) found that a third of the sampled automotive engineering teachers preferred to teach theory content only. The limited teaching of practical content to diploma-level students reflects what Koretz et al. (2001) refers to as 'narrowing of instruction' where the enacted curriculum is aligned with test weights rather than with inference weights. As a results, scores get inflated and students have high test scores but lack competence in practical skills. One of the participants pointed out this problem:

MuTTi_3:

The KNEC exam generally, if you focus on that and you say that this person has a distinction, maybe in civil engineering, or plumbing, ..., I tend to think that KNEC is not telling the truth.

They get As, but it is an A that can't help you in industry. I have trained the student to do the KNEC exam, to read and understand the drawing very fast, and fabricate for the exam. But out there, things are very different.

Other factors reinforce the above practices. For example, the enacted and real curriculum based on what KNEC chooses to examine, happens to be the same one that TVET teachers who were trained at the Kenya Technical Teachers College (KTTC) went through. On the other hand, universities rely on an old curriculum that has not been updated (Ronoh et al., 2013). Thus, many teachers lack the practical skills that they ought to teach to their students. The poor state of prior training of TVET teachers was summarized by one teacher as follows:

MuTTi_1:

Wait, how do I even know them personally, if personally I was taught using this content? How many teachers can maintain an Electronic Fuel Injection engine in Kenya today? Zero! He learnt using the old engine and it is the one he is teaching. How do you expect him to go and learn about the new one?

Apart from the effects of limited initial teacher education, participants also pointed out that limited infrastructure limits teaching of practical content. One teacher pointed out that while they did not avoid teaching of practical content, limited infrastructure hinders them from teaching it:

ThTTi_2:

I wouldn't want to ignore the practical part, but what would hinder me from doing it is if you do not have the facilities. If you do not have the facilities, then it becomes a challenge. You end up focusing on the theory, and then maybe supplement practical lessons with videos.

Further the available equipment is used by a large number of students:

NbTTi_1:

The teachers are not able to teach the practical lessons because the resources are too few for the students. Like only five lathe machines … so you only teach the theory.

MaTTi_3:

> *You can imagine a class of 40 [students] and only two days to test them. This is made worse by the lack of sufficient facilities to test them, or even train them.*

These factors reinforce each other. One teacher observed that after teaching and learning become theory oriented, the availability of machines does not change the practices.

*7.4.4.3 **Examination oriented teacher learning practices***

When participants were asked how the exit examinations influence their professional development practices, they indicated that the examinations form the general template that they use to guide what content they learn:

Interviewer:

> *In the case of KNEC examinations, do you feel they influence what you study and how you learn as a teacher?*

ThTTi_2:

> *Yes, they do. Because even when I am studying…, I normally have the KNEC questions. They guide me on what to read on. So, I study their pattern of examination. So, I know this are the areas to focus on, this are the areas they test on, yeah, that helps.*

McTTi_3:

> *If I know that an area is not going to be examined, then I would cheat you to say that I would stay there. I do not go where the examination will not focus.*

In reference to these, participants further pointed out that they feel constrained to learn and practice what is relevant for preparing students for the exit examinations. As one teacher put it, he is forced to focus less on practical content and more on theory:

KbTTi_1:

> *I would not say ignoring [practical content], but I have no option, because that is how it has been structured. I am forced to.*

Another teacher pointed out that teachers have limited time to learn such skills owing to the amount of theory content they are expected to teach:

NbTTi_1:

> *We have looked forward to improving our practical skills. But again, now that you have a lot of theory time with them, even your time to learn and practice practical skills is also limited. You want to learn the skills but you do not have time for them.*

*7.4.4.4 **Divergence of views and resulting teaching and learning practices***

The views expressed above paint a complex picture of how the curriculum and student evaluation practices influence TVET teacher CPD practices in Kenya. On the one hand, teachers appear to value practical content and wish to teach it and learn it, while on the other hand, the pressure of the examinations, limited initial teacher education and limited infrastructure limit how well they can provide quality instruction that focuses on both theoretical and practical content in a balanced way. It is also clear that the adopted teaching and learning practices are influenced by the characteristics of teachers and in particular the students they teach.

Theoretical framework had led to the expectation that teaching and learning practices could be influenced by different teacher characteristics. To further explore how teacher characteristics influence their views with regard to the national examinations and teaching and learning practices, means of these views were compared for different categories of teachers. No statistically significant differences were found based on age, gender, career stage, teaching subjects, and educational qualifications.

However, the mean differences with respect to the level of students the respondents frequently teach were instructive. Table 41 shows the means of the groups and the mean differences which were significant together with the t-test results. As can be seen from the table, teachers who teach mainly diploma students accept that their teaching and learning are examination oriented and that they are less likely to teach practical content.

Table 41: *Significant mean differences between levels of students handled*

Characteristic	Group	Mean	Significant differences	t	Sig. (2-tailed)
I teach content likely to be examined	Mainly Diploma level students	4.12	Significant, at $p < 0.05$	2.281	0.026
	Both Craft and Diploma students	3.78			
I rarely teach practical skills	Mainly Diploma level students	2.78	Significant, at $p < 0.05$	2.514	0.015
	Both Craft and Diploma students	2.17			

While the mean differences were not significant for the other statements, teachers who frequently teach diploma level students agreed more strongly with the statements that KNEC examinations are overly theoretical and out of date. They also agreed strongly with the statements that they do not focus their individual learning on practical content. These findings strongly suggest that the diploma-level examinations, which are more theoretical in content compared to craft-level examinations, more strongly influence teachers towards examination-oriented teaching and learning.

To further explore the influence of the curriculum and national examinations on teacher CPD, correlations between the statements with regard to the examination system and teaching practices were taken. The pattern of correlations is shown in Table 42

Table 42: *Correlation table: KNEC examinations and teaching and learning practices*

	Variable	a.	b.	c.	d.	e.	f.	g.
a.	KNEC examines theoretical content mainly	1						
b.	KNEC examines practical skills sufficiently	-.342**	1					
c.	KNEC examinations are regularly updated	-.313**	.475**	1				
d.	I teach content likely to be examined	0.077	-0.003	0.013	1			
e.	I learn content likely to help my students pass	0.136	-0.116	-.180*	.284**	1		
f.	I rarely teach practical skills	0.118	-0.127	-0.103	.173*	.378**	1	
g.	I do not learn practical skills	-0.009	-0.100	-0.122	0.017	.201**	.500**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The pattern of correlations suggested that the variables were uniquely correlated with each other. The negative and positive correlations between statements one, two, three suggest that teachers have either a positive or negative view of the national examinations, while the correlations between statements four and five suggest an orientation towards examinations. The correlations between statement find and six on the other hand suggest an orientation towards teaching and learning of practical content.

To verify this analysis, exploratory factor analysis was carried out. While the results of the exploratory factor analysis did not render themselves to a clear-cut identification of distinct factors, they suggested that teachers hold either positive or negative views of the examinations. Teachers can also be categorized as weakly or strongly orientated towards teaching and learning for examinations and as weakly or strongly oriented towards teaching and learning of practical content.

To test these hypotheses, cluster analysis of the variables was undertaken. In line with Gore's (2000) recommendations, hierarchical clustering was first done using Wards method with squared Euclidian distances. After studying the resulting dendrogram and agglomeration schedule, three clusters were identified. at the rescaled distance value of approximately 18. Figure 15 shows the dendrogram obtained with the three clusters highlighted. Pearson's similarity matrix was then done, resulting in a similar dendrogram and cluster solution.

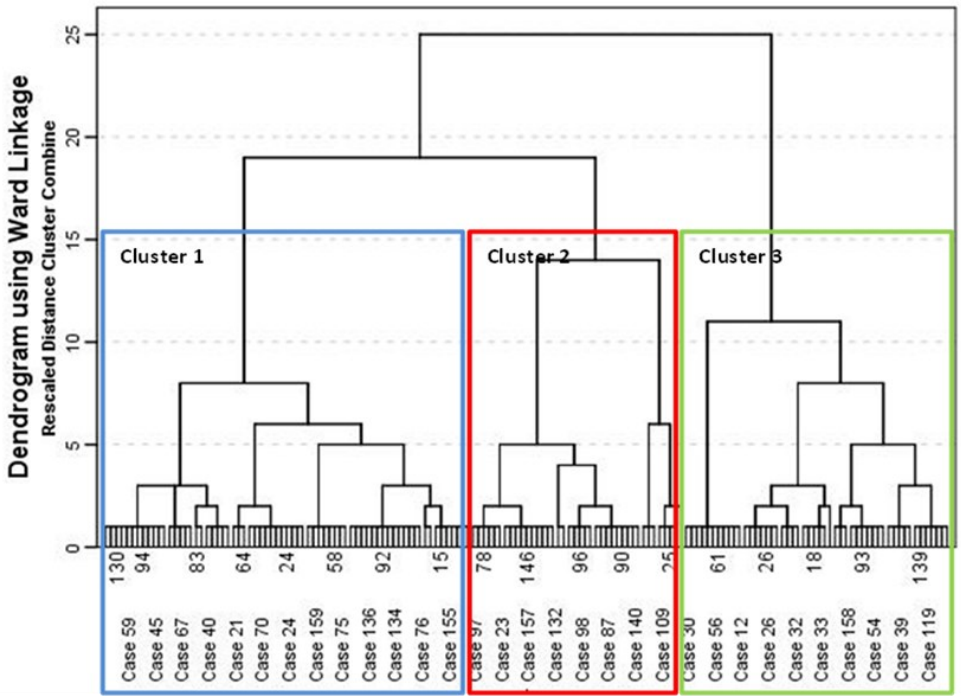


Figure 15: *Views on KNEC and teaching practices dendrogram*

Based on this, K-Means cluster analysis was conducted with the number of clusters set to three. Table 43 shows a summary of the cluster sizes, their means, standard deviations and eta-squared values for the variables used to identify them.

Table 43 : *Cluster sizes, means (standard deviations) and eta squared coefficients for the views on knec examinations and teaching practices*

Views of KNEC examinations and teaching practices	Eta Squared	Cluster 1 (N =78) Mean (SD)	Cluster 2 (N = 33) Mean (SD)	Cluster 3 (N = 59) Mean (SD)	Total (N =170) Mean (SD)
KNEC examinations focuses on theory	.42	3.53 (1.00)	2.64 (1.29)	1.63 (0.76)	2.69 (1.3)
KNEC examinations are regularly updated	.26	3.44 (.95)	2.94 (1.14)	2.15 (0.91)	2.89 (1.13)
KNEC examines practical skills sufficiently	.19	3.68 (.76)	3.21 (1.32)	2.59 (1.07)	3.21 (1.11)
I teach content most likely to be examined	.08	3.58 (.98)	4.26 (.68)	3.96 (.96)	3.85 (.96)
I learn what is most likely to help my students pass	.22	2.9 (1.28)	4.39 (.7)	3.75 (1.11)	3.48 (1.27)
I rarely learn practical content	.34	4.4 (0.73)	2.85 (1.35)	4.44 (0.73)	4.11 (1.07)
I rarely teach practical content	.56	4.28 (0.74)	1.82 (0.73)	3.98 (1.01)	3.7 (1.25)

To aid description of the clusters, Figure 16 was generated showing the combined cluster means for each of the clusters with regard to views on KNEC examinations, examination-oriented teaching (i.e., teaching content most likely to be examined and teaching content most likely to help students pass in the examination) and an orientation towards teaching and learning practical content.

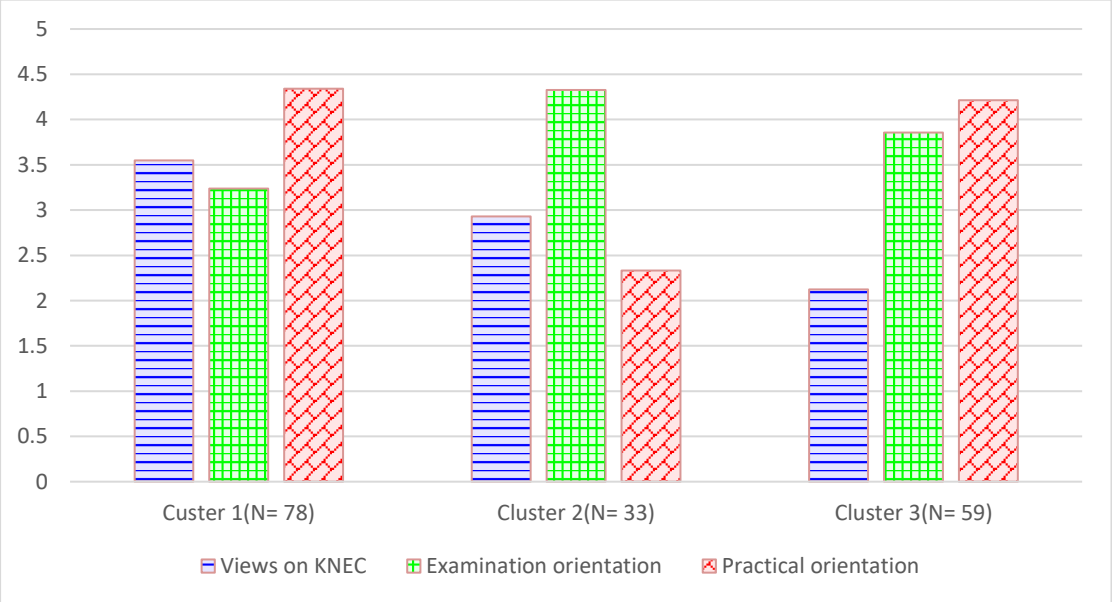


Figure 16: *Cluster means for views on KNEC examinations and teaching practices*

Teachers in the first category hold a more positive view of the KNEC examinations, viewing the examinations as balanced and not overly theoretical, regularly updated and examining practical content sufficiently). This positive view of the KNEC examinations is associated with a lower-than-average orientation towards teaching and learning for the examinations. These views are further associated with a higher likelihood for teaching and learning practical content.

Teachers in the second category hold a more neutral view of KNEC examinations. However, teachers in this category are the most examination oriented and focus their teaching and learning towards content expected to feature in the examinations. This view is further associated with the lowest likelihood of teaching or learning practical content.

The third cluster consists of teachers who are the most critical of the KNEC examinations (i.e., they are more likely to view the examinations as overly focused on theory, not regularly updated and examining practical content insufficiently). This critical view is associated with a higher-than-average orientation towards teaching and learning for the examinations and a slightly higher than average likelihood to teach and learn practical content.

7.5 Research question 6: Policies to improve TVET teacher CPD in Kenya

The last research question focused on the policies and other institutional practices that can lead to and support effective TVET teacher CPD in Kenya. The findings relating to how teachers view current policies and the recommendations they made are presented below.

7.5.1 View on current policies on teacher CPD

While a majority of the respondents felt that they are familiar with current policies, 40% of the respondents felt that they are not adequately familiar with current policies on teacher CPD. Opinion was equally split on whether current policies are clear and can be understood easily: only 49% of the respondents agreed that policies are clear. However, only a third of the respondents agreed with the statement that current policies are

adequate and effective. Instead, two thirds of the respondents agreed that current polices need review. Results are presented on Table 44.

Table 44: *View on current policies on teacher CPD*

View on current policies on teacher CPD	Disagree (%)	Neutral (%)	Agree (%)
I am familiar with the current policies on the professional development of	16.7	22.6	60.7
The current policies are clear and easily understood.	22.0	29.2	48.8
Current policies are adequate and effective	23.8	41.1	35.1
Current policies need review	9.6	24.8	65.6
There are no policies	67.7	22.2	10.2

7.5.2 Recommendations by the participants

The final interview question invited the participants to give recommendations to improve TVET teacher CPD in Kenya. The suggestions were then coded and categorized. A summary of the codes and the code categories is shown in Table 45.

The most frequent recommendation was that teacher CPD should be mandatory, scheduled and sponsored. Related to this was the recommendation to reward and incentivise teacher CPD. Rewards and incentives for CPD were often put together with the recommendation to link promotions and appointments with CPD and hence ensure equity and meritocracy.

Since teachers felt that they do not have enough time for CPD, they also frequently recommended that they should receive time off to engage in professional development. This was either in the form of scheduled time for learning or longer study leaves. Others called for a reduction in workload to enable them have time for CPD, reviewing the school calendar, and hiring more teachers.

Participants also identified different modes through which teacher CPD could be availed to them. Apart from in person trainings, workshops, and seminars, on-line modes of learning were also identified. The participants also stressed Lecturer Industrial Attachment to ensure that TVET teachers remain connected with the world of work and technological developments. To entrench TVET teacher CPD in the institutional framework, a common recommendation was to review and implement policies on TVET teacher CPD.

Table 45: *Policy Recommendations by Teachers*

Code	Code Category
Funding Scholarship to trainers	Financial Support
LIA every five years LIA to every trainer annually Scheduled and Mandatory LIA	Lecturer Industrial Attachment
Re-certification Continuous assessment of competence CPD should be part of performance contracting Mandatory and sponsored training	Mandatory CPD
CPD courses that align with the school calendar Study Leave Time off for CPD	Time off for CPD activities
Attend a course every two years Once per year Trainers should go for training every three years	Schedule Recommendations
Clear Policies on CPD Involving teachers in policy making Setup a staff development policy	Policy review
More teachers Reduced Workload	Reduced workload
Require documentation of CPD Incentives Recognize and reward achievement	Recognize, reward and incentivise CPD
Certification Documentation of CPD	Documentation of CPD
CPD activities to be a criteria for promotion Equitable distribution of learning opportunities Appointment should be based merit	Equity/Meritocracy
Continuous training, workshops, seminars Offer Mentorship Online learning	Modes of providing CPD to TVET Teachers

7.6 Chapter summary

The findings reported above show that TVET teachers in Kenya have a complex view of TVET teaching and teacher CPD. Moreover, their views also influence their CPD practices. Different aims, content and learning methods have also been identified and shown to vary with the characteristics of teachers and to be influenced by various contextual factors. The next chapter discusses these findings in relation to the theoretical framework and wider literature on teacher CPD.

Chapter 8 Discussion

This chapter discusses the study findings reported in the previous chapter. The chapter starts by briefly summarizing the theoretical framework, after which it discusses the study findings in relation to the theoretical framework and literature on teacher CPD. The discussion is interspersed with recommendations to resolve some of the issues identified. The chapter concludes by identifying the main challenges that confront TVET teacher CPD in Kenya.

8.1 Introduction

This study sought to investigate the CPD practices of TVET teachers in Kenya. This involved an exploration of the conceptions and held meanings about teaching and teacher CPD, identifying the CPD practices that TVET teachers engage in, and identifying the different factors that influence their CPD practices. To attain these objectives, data relating to TVET teachers' CPD practices were collected and analysed.

From the reviewed literature, it was concluded that teacher CPD practices are characterized by multiple aims, diverse content, and a wide-range of learning methods. Moreover, different personal and contextual factors influence the aims, content and learning methods that characterize teachers' participation in teacher CPD. To better understand and explain teacher CPD practices, a theoretical framework, derived from the reviewed literature, the adult learning framework, and rational choice theory was proposed. Viewing teachers as self-directed adult-learners and rational actors, it was taken that teachers decide if and when to participate in CPD, what content to learn, and the learning methods to use. Teachers make these choices depending on what the context makes available to them and influenced by their beliefs and past experiences. They therefore time their CPD, seek learning content, and choose learning methods that best align with their motives and learning goals.

The analysis of the collected data thus focused on identifying the aims, content, and learning methods that characterize TVET teacher CPD in Kenya. The analysis also focused on identifying how different personal and contextual factors influence the CPD choices that TVET teacher take with regard to their CPD. Below is a discussion of the study findings in relation to the theoretical framework and wider literature on teacher CPD.

8.2 Conception of teaching and TVET teacher CPD

When the study participants were asked to describe what it means to be a TVET teacher, some participants described teaching as an occupation while others described teaching in loftier terms and described it as a calling and service to humanity. Despite the divergence in the description of what it means to be a teacher, a recurrent theme was the view that teaching is a purposeful activity that seeks to produce independent and dependable individuals. Achieving this aim is seen as involving two main activities: Training and Character Development. As trainers, TVET teachers instruct and impart knowledge to students with the aim of developing useful competences in students. As character developers, teachers seek to help their students develop desirable values and ethics. TVET teachers are thus instructors, role models, guides, and counsellors. Additional roles include supporting the generation of new knowledge and solving societal problems. Good TVET teachers were thus described as dynamic, confident and ethical individuals who had mastered the content they teach and could manage their students and classrooms. A constructivist conception of teaching was apparent with teachers being required to focus on the needs of learners.

This complex view of TVET teaching as a complex of roles that centres on instructing, presenting information and supporting students' character development mirrors the finding by Köpsén (2014) that VET teachers view their work as involving more than just teaching. Instead, working as a VET teacher involves fostering students to become fully engaged students, preparing students for a working life, and offering guidance into responsible adulthood. Similarly, Tyler & Dymock (2021) found that in constructing their vocational identity, vocational teachers saw themselves as professionals with a responsibility to facilitate learning while Tran & Le (2018b) found that VET teachers view themselves as mediators and facilitators.

From their view of TVET teaching as a complex of roles that centres on instructing, presenting information and supporting students' character development, participants identified mastery of content and good delivery skills as key competencies for TVET teachers. Other competencies are identifying and responding to student needs, classroom management skills, planning and documenting teaching activities, and evaluating learning. Life skills such as learning to learn competencies and therefore being able to keep up to date and develop awareness of the educational and

technological contexts, having an ethical attitude, and confidence were also identified as essential professional competencies.

The competencies identified closely mirror those identified by Shulman (1986) and are a close restatements of Shulman's categories. Mastery of content refers to subject content knowledge, while teaching and delivery skills refer to pedagogical content knowledge. General awareness of the educational and technological context refers to general pedagogical knowledge. It can therefore be concluded that the competence domains described by TVET teachers in Kenya agree with existing theoretical frameworks.

This finding supports previous findings on TVET teacher competencies. For example, in a study focusing on how Australian VET teachers define a good teacher, Smith & Yasukawa (2017) found that disciplinary expertise as well as good pedagogical competencies are seen as essential for one to be a good teacher. Similarly, in a review of empirical literature on the professional competencies of vocational teachers, Antera (2021) identified that the professional competencies of vocational teachers are taken to include being up-to-date with the all aspects of the vocations they prepare students for, well developed teaching skills, a self-development attitude, humanistic values, responsibility and accountability. In their systematic review of literature on vocational teacher CPD, Zhou et al. (2022) identified similar competencies.

However, and perhaps in contrast to other contexts, TVET teachers in Kenya appear to assume that mastery of content translates to good teaching skills. Some teachers further seem to be unaware that teaching skills (i.e., pedagogical content knowledge) can be developed by learning pedagogical techniques specific to the content they teach. The awareness likely stems from the competency model TVET teachers in Kenya have about teaching. As adult learners, teachers can only identify competencies and diagnose their learning needs in accordance with the competency models that they are aware of and use (Henschke, 2009). Where the competency model in use does not specify a particular competency, the need to develop that competency will not be felt. The unawareness may be as a result of lack of pre-service teacher education, or pre-service teacher education that fails to develop sufficient awareness of pedagogical knowledge and pedagogical content knowledge. Earlier, Oroni (2012) found that the pre-service teacher education curriculum in Kenya does not focus extensively on subject specific

teaching methods. Hoekstra et al. (2018) also observed that vocational teachers often face challenges in accessing training on pedagogy and subject specific teaching methods due to the specialized nature of their subjects. TVET teachers in Kenya should therefore be supported to develop and adopt broad and exhaustive teacher competency models. Further, the TVET teacher education curriculum should be expanded to help TVET teachers develop sufficient awareness of pedagogical knowledge and pedagogical content knowledge specific to TVET.

8.3 Aims and motives for TVET teacher CPD

The conceptions of who a good teacher is and the competencies they should possess were found to influence how TVET teacher CPD is conceptualized and practiced in Kenya. Continuing Professional Development of TVET teachers is predominantly conceptualized as, and practiced as, any activity that leads to improved delivery of knowledge and skills to students. A core aim of TVET teacher CPD in Kenya thus relates to improved teaching. This aim is part of the more general aim identified in the study which relates to improved task-performance competence. Another aim of teacher CPD identified was career progress and more generally, improved status and authority. Getting relief from boredom and monotony and meeting requirements were the other aims of teacher CPD. In agreement with the theoretical framework, these aims were found to not only vary with the characteristics of teachers, but to also influence the choice of content and the learning methods teachers adopted for their CPD. These aims are further discussed below.

8.3.1 Teacher CPD for task performance competence

A key reason for engaging in teacher CPD was to improve the ability to perform the tasks and roles of teaching. However, CPD focused on improving task-performance competence is not limited to the tasks of teaching, but also focuses on all the tasks and roles that teachers play as professionals. Teacher CPD may therefore be sought for a variety of performances including improving skills related to non-teaching responsibilities. Such learning or its effectiveness may therefore be undetected in traditional evaluations that focus on student learning outcomes or evaluations that use improved test results to determine the effectiveness of teacher CPD. CPD for task performance competence agrees with the motive to improve teaching observed by

Appova & Arbaugh (2018), Hildebrandt & Eom (2011) and Rzejak et al. (2014). The motive is also similar to the motive to improve professional knowledge and skills observed by Dia et al. (2005) and Kowalczuk-Walędziak et al. (2017).

Based on this aim, teacher CPD takes the form of "information search", where information needed to execute a task is identified and then "learnt". Learning is therefore focused on acquiring detailed information about something that has direct relevance to the tasks that a teacher is expected to do. For example, to improve "mastery of content" and "delivery skills" associated with good teaching, teachers identify the content that they should learn and take time to learn that content. Content can be learnt by visiting the library and reading books or searching for content online. With respect to improving teaching practices and methods, or dealing with students' conceptual difficulties, teachers often engage in dialogue with other teachers.

The frequent use of informal learning methods to improve teaching has previously been observed by Lecat et al. (2019). The finding that teachers seeking to improve their task performance competence adopt embedded learning methods and professional dialogue with colleagues also agrees with findings by Pool et al. (2016), who found that when nurses in their study sought to increase competence and deepen knowledge, they used a variety of self-directed learning activities such as consulting media, colleagues and superiors.

8.3.2 Teacher CPD for status and authority

Apart from improving task-performance competence, teacher CPD also serves as a ladder to better positions, higher earnings, and greater influence. Participants observed that they also use their CPD as a way to get externally awarded benefits such as promotions or get appointed into administrative positions. Others use CPD to secure the positions that they have been appointed to. For teachers with low academic qualifications and feeling insecure about their jobs and positions, teacher CPD is used to bolster their confidence and status. A similar motive was identified by Hildebrandt & Eom (2011) where CPD is used as a path to validation and financial gain. Rzejak et al. (2014) similarly observed that CPD is often used for career progress.

In this orientation, teachers participate in CPD to establish authority and attain higher levels of influence. Higher levels of influence may be at a personal level, at a professional level, or a combination of both. At the personal level, promotion and

therefore higher earnings, translates to better control over personal affairs. Similarly, attainment of higher academic qualifications is used to command greater respect. At the professional level, appointment to administrative positions translates into deciding and directing what takes place within an institution or in the education sector. The motivational orientation was therefore labelled as CPD for Status and Authority.

Where CPD is being used as a means to status and authority, teachers participate in formal CPD leading to widely accepted formal qualifications such as a Bachelor's Degree or a Master's Degree. Others may seek professional training in their areas of specializations to get certified as competent. In this orientation, the focus is on getting formal qualifications and what those qualifications enable the teachers to get. This findings supports previous findings, for example, Kowalczuk-Walędziak et al. (2017) found that some teachers enrolled for post-graduate studies to improve their chances of being promoted while Pool et al. (2016) found that the career enhancement and development goal was associated with postgraduate education.

8.3.3 Teacher CPD for rejuvenation and renewal

A third aim identified was to get relief from boredom and monotony. Here, teachers seek novel content and learning experiences that take them outside of their usual routine. The use of teacher CPD to get relief from routine has been noted elsewhere, for example, in Richter et al. (2019). In their study, Kowalczuk-Walędziak et al. (2017) found that one of the reasons teachers enrolled for PhD studies was to get relief from routine and avoid falling into apathy. In this case CPD has the value of dealing with the challenge of burn out. It allows teachers to step out of their classrooms and normal work schedule.

Teacher CPD may thus serve to help teachers get relief from routine and in turn helps teachers to remain engaged with their work. Late-stage career teachers are more likely to participate in CPD for rejuvenation. This is because after working for many years, they are the ones most likely to tire of the routine of teaching and find teaching as monotonous. They also have less hope of being promoted to administrative positions. They may also use the CPD as a way to build a more interesting life after they retire.

The learning strategy most likely to be adopted is a university programme that is likely to present new content. In this case teachers are willing to spend money even when it is clear that they are unlikely to receive pecuniary benefits from their CPD. This finding

agrees with the view that when teachers learn to satisfy the intrinsic need to learn, the content learnt in such cases may not necessarily relate to or contribute to classroom teaching (Appova & Arbaugh, 2018). Pool et al. (2016) made a similar finding in health care settings, where nurses enrolled for postgraduate programmes as a way to get relief from routine as well as to get challenged. And in Jarvis' (2004) literature review on adult education research, multiple studies identified relief from routine as motivation for participation in adult education.

8.3.4 Teacher CPD as a requirement

Another aim for participating in teacher CPD relates to fulfilling requirements. For example, to avoid sanctions, teachers attend training programs that they have been asked to participate. Teachers therefore sometimes seek CPD to comply with external requirements or to attain externally set goals and policy objectives. Under such conditions, teachers choose learning activities which can easily be reported to evidence having met the requirements.

Teacher CPD thus takes the form of a requirement and participating in teacher CPD is an act of compliance (Larsen & Allen, 2021). This motivation is similar to the motivational orientation related to compliance with authority identified by Dia, Smith, Cohen-Callow, & Bliss (2005) and compliance to requirements identified by Appova & Arbaugh (2018), Pool et al. (2016) and Rzejak et al. (2014). Other studies in adult education have also identified meeting formal requirements as reason for learning (Jarvis, 2004).

Factor analysis on the surveyed motives for teacher CPD further supported the above findings. In the first factor, improved teaching skills, improved subject knowledge, and better student performance aligned with the CPD for task performance competence. In the second factor, motives for career progress and career change aligned with CPD for Status and Authority. However, it was not possible to extract factors related to the other orientations. This is likely because the survey had not been designed to explore a larger set of motives. An expanded study to test the resulting model is therefore called for.

8.4 Content and learning methods

The preceding discussion has described the aims identified and linked those aims to the choices teachers make with respect to content and learning methods. The aims have also

been shown to vary with the personal characteristics of teachers and to be influenced by the institutional context. The discussion below elaborates on the patterns observed with respect to content and learning methods.

8.4.1 TVET teacher CPD content

TVET teachers in Kenya were found to frequently focus their CPD on content related the teachers' subject areas. Content aimed at developing pedagogical knowledge and pedagogical content knowledge was found to be less frequently chosen. Interview participants clarified that they focus on subject content knowledge with the aim of improving mastery of subject knowledge. This agrees with the study's finding on the beliefs about teaching and professional competency. TVET teachers in Kenya were found to hold the view that good teachers should have strong mastery of content. As such, interview participants justified their stronger focus on subject matter knowledge by arguing that mastery of subject content knowledge is what matters most for good teaching.

It is also possible that vocational teachers in Kenya focus less frequently on PCK simply because they face difficulties in accessing PCK related content. It has been observed elsewhere that owing to the highly technical nature of TVET content, vocational education teachers often lack access to materials focusing on teaching methods specific to their trades (Hoekstra et al., 2018; Lucas et al., 2012). Moreover, TVET teachers often lack systematic trajectories to ensure that they develop all their professional competencies (Gamble, 2013).

The stronger focus on subject content knowledge by teachers has been observed elsewhere. For example, in TALIS 2018, knowledge related to teachers' subject area was the most frequently covered content area (OECD, 2019). Using a similar instrument to collect data, Stanley (2021) found that knowledge and understanding related to teachers' subject areas was among the most popular content areas covered by vocational teachers in in nine countries in Western Balkans and Turkey.

8.4.2 TVET teacher CPD learning methods

To investigate the choice of learning method, participants were asked to indicate how frequently they used different learning methods. Learning methods had been

categorized into four categories i.e., formal, collaborative, self-paced, and practiced based.

From the category of formal CPD activities, the most frequently used learning method was attending workshops and seminars, followed by short training courses and college and university courses respectively. In the collaborative learning methods category, mentoring and coaching was the most frequent, and from the self-paced CPD category, reading on subject matter was the most popular followed by watching videos about subject matter. Teachers also frequently engage in discussions about teaching practices. Overall, the most frequently used learning methods were reading and watching videos about subject matter followed by attending workshops and short training courses.

Among the least frequently used learning methods were supervising other teachers and writing reflections about practice with more than half of the respondents indicating that they never engage in reflective writing about their practice and outcomes. In the self-paced category, watching videos about teaching methods ranked as the least popular, while in the formal CPD activities category, attending educational conferences was the least popular. Overall, the least frequently used learning methods were visiting other institutions, writing reflections and participation in teacher clubs.

The results in this study mirror findings by other researchers. Focusing on the participation of vocational teachers, Stanley (2021) found that conferences and seminars attracted the highest level of participation. This was attributed to the fact that this type of CPD receives the most funding and recognition from educational authorities. In TALIS 2018, the most frequently attended professional development activities were courses and seminars and reading professional literature. On the other hand, participation in collaborative forms of professional development was found to be much more infrequent (OECD, 2019). Broad (2016) identified that formal CPD methods are relatively popular in the Further Education sector in the United Kingdom while Lecat et al. (2019) observed similar uses of informal learning methods. However, unlike Broad's study, the use of professional literature by TVET teachers in Kenya is restricted to text books with limited use of primary or secondary literature. The finding that TVET teachers in Kenya rarely engage in reflective practices corroborates earlier observations that reflective practices are not common in Kenya (Bunyi et al., 2013; Lowe & Prout, 2018; Macharia, 2020).

8.5 Factors influencing CPD practices

In agreement with the theoretical framework both personal and contextual factors were found to influence TVET teacher CPD practices in Kenya.

8.5.1 Personal factors

With respect to the factors influencing the choice of content, teachers who had received Initial Teacher Education (ITE) were found to be more likely to focus their CPD on pedagogical content knowledge and general pedagogical knowledge compared to teachers who had not received ITE. This led to the conclusion that pre-service teacher education has a positive effect in sensitizing teachers on the value and importance of pedagogical content knowledge and general pedagogical knowledge.

The choice of content was also found to depend on how helpful the content was perceived to be: teachers who identified a given content area as helpful and positively impacting on their practice were found be cover that content area more frequently. Thus, teachers choose content if it enables them attain the performance competence they seek to develop. This is in line with adult education theory where adult learners learn with a specific problem in mind and consider a learning process as meaningful if it brings them closer to solving that problem (Rubenson, 2011; Tight, 2002). This finding supports the theoretical framework, i.e., teachers choose content that best supports their learning goals.

In agreement with the theoretical framework, the choice of learning method was found to be associated with the aims teachers have for their learning as well as personal and contextual factors. For example, as part of their CPD for Task Performance Competence, teachers were found to engage in professional dialogue with the aim of finding better ways of doing something or to resolve a challenge they were facing. However, other collaborative learning methods such as lesson observations were found to be less frequently used due to the lack of time and the lack of a framework to guide collaborative learning practices.

Similarly, as part of CPD for Status and Authority, frequent use of formal academic learning was observed and linked to the pursuit for career progress. The frequent use of formal academic learning was observed when the educational qualifications of the

participants at the start of their teaching careers were compared with their current educational qualifications. This is in agreement with an earlier finding by Ferej et al. (2012) in which 44 per cent of the teachers polled had engaged in some form of formal academic training; the most popular form being enrolling for Bachelor's Degree or a Higher National Diploma. TVET teachers in Kenya have been previously observed to seek in-service training in the hope of better placement (UNESCO-UNEVOC, 2018).

Other personal characteristics were also found to influence the use of different learning methods. These include the career stage of the teachers, holding a non-teaching responsibility, and whether or not a teacher has received Initial Teacher Education (ITE). For example, teachers who have received ITE were found to participate more frequently in many of the CPD activities surveyed. Middle and Late Career stage teachers were found to participate more frequently in coaching and mentoring activities, curriculum development, and the design and development of learning materials and content. This is similar to the finding by Richter et al. (2010) and Maksimovic (2016) where the researchers found differences in participation rates depending on teachers' career stages. Compared to teachers without administrative responsibilities, teachers with administrative responsibilities were found to more frequently take part in CPD activities related to attending educational conferences, mentoring and supervising other teachers, reading grey literature, and visiting other institutions. This finding mirrors the finding in TALIS 2018 that principals attend more CPD activities than other teachers (OECD, 2019).

8.5.2 Contextual and institutional factors

Contextual and institutional factors were also found to influence TVET teacher CPD practices. This was most aptly demonstrated with respect to the use of mentoring and Lecturer Industrial Attachment, where institutional practices and the conceptions underlying those practices, absence of policies, and the general unavailability of learning opportunities and time for learning limit their use. Student assessment practices revealed complex effects on both teaching and CPD practices. These are briefly discussed below.

Limited use of Lecturer Industrial Attachment

Despite viewing Lecturer Industrial Attachment (LIA) as important and therefore wishing to attend LIA, more than a third of the participants indicated that they had never attended LIA. The finding agrees with an earlier finding that TVET teachers in Kenya rarely have the opportunity to participate in Lecturer Industrial Attachment (Sang et al., 2012) and aligns with the theoretical framework that teachers in a given context use the learning methods that they are aware of and are able to access and use.

Low participation in LIA was attributed to the view that industrial attachment is for students only, lack of time due to heavy teaching work-loads, and the lack of a framework to guide LIA. For training institutions located away from major industrial hubs, the lack of firms and work-places within reachable distance was a further hindrance. Moreover, the lack functional collaboration between the TVET institutes hinders LIA. This was in agreement with prior studies that have found that vocational training institutions in Kenya generally lack linkages with industrial firms and other work-places (Kipkogei et al., 2020; Makworo et al., 2013; Wilberforce Manoah Jahonga et al., 2016). In the study by Makworo et al., (2013), linkages involving staff exchange, research collaboration, instructors' industrial experience, and equipment sharing were responded to as non-existent by the survey respondents. In their study on how enterprises support TVET teacher training programs in the western region of Kenya, Kipkogei et al. (2020) found only one firm that offered opportunities for teachers to take up internships.

However, while the lack of linkages may explain low participation in LIA, the lack of LIA may also explain the lack of linkages between firms and training institutions. That is, LIA may serve not just to support teacher learning, it may also serve to support the establishment of linkages, both at a personal level and official level, between the firms and training institutions. Thus, another good reason to support LIA is to encourage and facilitate liaison between educational institutions and industry.

The barriers and challenges to LIA identified above further agree with findings by Clayton et al. (2005) in Choy & Haukka (2009). They identified resource constraints, such as lack of time and challenges in releasing and replacing teachers when they go out of the school for professional development; practical challenges such as difficulties in finding workplaces that are willing to host teachers, lack of industries within the

reachable distance, organisational impediments such as devaluing of the importance of technical skills, and lack of incentives and policy within the institutions; and dispositional challenges, such as lack of confidence, lack of motivation, and teachers' failure to recognize their own skill deficits.

Limited use of mentoring

With respect to the use of mentoring as a collaborative learning method, TVET teachers in Kenya were found to value mentoring and appreciative of the important role that mentorship plays in supporting new and beginning teachers . However, mentoring practices are limited to basic introductions and incidental supportive dialogue between teachers. Moreover, guidelines to structure and guide mentoring are yet to be developed. New and beginning teachers are therefore not adequately mentored.

The limited use of mentoring as well as the lack of a well-developed system to mentor new teachers was attributed in part to how mentorship is conceptualized and therefore practiced. Mentoring has largely been conceptualized as the introduction and orientation of new teachers rather than as a sustained and supportive relationship between a more experienced teacher and a new teacher. Thus, after brief introductions, new teachers are often left on their own without mentorship.

Mentorship is also viewed as a remedial activity to support new teachers who are unable to teach. Hobson et al. (2015) note that such a view creates a stigma against mentorship as a supportive relationship Further, it is assumed that that mentors should be teachers with administrative responsibilities such as Heads of Departments. Apart from limiting the time available for mentorship, using superiors hinders the development of open and trusting relationships necessary for mentorship (Hobson et al., 2015; Hobson & Maxwell, 2020).

The lack of guidelines to structure and guide mentoring renders mentoring incidental as new and beginning teachers are not necessarily assigned mentors. Further, even when a mentor is assigned, there are no specified goals to works towards or requirements for regular interactions. Accordingly, there is little direct incentive to engage in comprehensive mentorship. These limitations are further compounded by the lack of time. As Cunningham (2007) argued and Hobson & Maxwell (2020) demonstrated, effective mentoring requires a clear framework to identify and allocate mentors to new

teachers. Further, the framework must clarify mentor roles and responsibilities. Unfortunately, Ochanji et al. (2017) noted that in Kenya, no policy exists to guide teacher mentoring.

Student assessment practices

As part of the contextual factors, the evaluation system was found to influence the CPD practices of TVET teachers in Kenya. From the analysis of both the interview data and survey data, it was found that both the exit examinations and the curriculum underlying the examinations influence what and how teachers teach and the content teachers choose to focus their professional development on. In particular, a significant majority of the surveyed teachers agreed that they teach content most likely to be examined. Teachers also agreed that they choose to learn content most likely to help their students pass in their examinations.

During the interviews, participants revealed that both the training institutions and teachers are evaluated in terms of how well their students perform in the national examinations. TVET teachers in Kenya therefore choose to focus their teaching on content that is regularly examined while content that does not get examined hand falls out of focus. Further, they align their teaching methods with the mode of the examinations since doing so will ensure that their students perform well in the examinations. Teaching, student learning, and teacher CPD thus follow the assessment practices with the KNEC examinations forming the *de facto* curriculum. Student assessment practices, and in particular national examinations have been observed to alter content and pedagogical practices in Kenya and thus turn into the real curriculum and replace the formal or defined curriculum (Somerset, 2011; Sultana, 2018; Wasanga & Somerset, 2013).

One goal of teacher learning is thus to figure out what the examination system requires of the students and how to help students meet those requirements. Since such knowledge cannot be attained through formal learning channels, teachers are reliant on trial and error, using content derived from past examinations to identify and master the content areas that the examinations usually focus on, and informal discussions with more experienced colleagues. Past examination papers, and in effect past examinations, are therefore an important guide for choosing content to present in class and the CPD content to learn. Murungi (2019) had made a similar finding on the extensive use of past

examination papers in Kenya. This goal and the associated learning methods aligns well with CPD for task-performance competence identified earlier.

As a reflection of these effects, a simplified mode of assessing practical skills was found to have led to a narrowing down of the curriculum. The simplified assessment method, relying exclusively on pen-and-paper tests to assess mastery of practical skills, dis-incentivises teachers and students from spending time in the workshops to teach or learn practical skills. The limited teaching and learning of practical content to diploma-level students reflects what Koretz et al. (2001) refers to as 'narrowing down of instruction'. Narrowing down of instruction occurs when teachers reallocate teaching resources to curriculum elements that have high test weights (in this case theoretical content) from elements that have low test weights but high inference weights (in this case practical content). Similar observations have been made in Kenya before. For example, in a study on the development of English literacy among primary school children in Kenya, Vikiru (2011) found that learners rarely learnt and therefore performed poorly on skills that were not tested directly by the conventional examinations.

Apart from the simplified mode of assessment, limited teaching and learning of practical content was attributed to the lack of time, resources, time, and financing. In particular, the curriculum was seen as theory heavy and thus limits the time available for teaching practical content. Further, TVET teachers, whose training was under similar conditions, join teaching with limited knowledge of practical skills and therefore avoid teaching and learning practical content. Similar observations have been made before. For example, in their study of the teaching strategies used by TVET teachers in Kenya, Lumumba et al. (2020) found that while TVET teachers are aware of constructivist and active learning methods, teachers prefer to use more traditional methods such as lectures, note taking and handouts and avoid more active teaching methods such as practical sessions in workshops. TVET teachers defended their adopted strategies on the basis that active teaching methods take up too much time and it would therefore be impossible to complete the set syllabus on time. Teachers further indicated that the use of written examinations to evaluate learners leads to the use teacher-centred methods such as lectures. Such methods are preferred because they enable teachers to cover the large amount of content likely to be examined, as opposed to the use of practical lessons which develop skills that are not examined.

Cluster analysis of the views on the examination system and teaching and learning practices led to the identification of different views towards the national exit examinations and resulting teaching and learning practices. The clustering shows that teachers with a more positive view of the national examinations are less likely to be examination oriented in their teaching and learning. On the other hand, teachers critical of the examination system are more likely to orient their teaching and learning towards the examinations. However, despite their critical views on the national examinations, some teachers retain a high orientation towards practical content and put an effort to learn and teach practical content despite the limitations imposed by the curriculum and availability of resources. Tóth & Csapó (2022) identified a similar bifurcation of responses to examination practices when they investigated teacher's beliefs about the effects of the assessment system and resulting changes in teaching practices in Hungarian VET.

8.6 Impact and effectiveness of TVET teacher CPD

With respect to the impact from CPD, teachers felt that participating in CPD had led to improved confidence, improved teaching skills and improved student performance. The most frequently reported change in practice due to CPD relates to updating the content presented in class and providing demonstrations, while the least common effect was being able to collaborate with other teachers. The strong focus on subject content knowledge aligns well with updating the content taught in class and providing demonstrations.

The study findings mirror findings by Stanley (2021) who in a survey on the CPD practices of vocational teachers in Eastern Europe found that vocational teachers reported differences in impact across different content areas. Content focused on the teachers' subject areas, modern practices in the workplace, and ICT skills for teaching were reported to be the most impactful, while content focusing on teaching in multilingual setting was reported as the least impactful. In Serbia, VET teachers, rated as most impactful, content related to subject-content knowledge and knowledge of the curriculum. Other content areas rated as impactful were ICT skills for teaching and new technologies in the work place (Maksimovic, 2016).

When asked to assess if their prior CPD activities met the criteria for effectiveness, it was found that majority of the teachers felt that their CPD activities were content focused and coherent in most cases. However, more than a third of the respondents felt that their CPD activities were rarely collaborative and sustained for sufficient duration of time. This suggests that the CPD activities do not fully meet the criteria for effectiveness. These findings are consistent with other research findings. For example, in TALIS 2018, only 41% of teachers who found their CPD to be impactful reported that their CPD activities took place over an extended period of time (OECD, 2019).

While sample means showed that teachers perceived relatively strong impact from their CPD, analysis of the data using cluster analysis revealed a category of teachers who report relatively low impact from their CPD activities. Similarly, cluster analysis on the effectiveness of past CPD activities revealed a category of teachers who engage in CPD activities that rarely feature the attributes associated with effective CPD. This suggests the need for targeted intervention to support teachers engaging in low effectiveness and low impact CPD. Further research to develop a clear profile of teachers in each category is called for.

8.7 Challenges and costs

Apart from beneficial outcomes and other incentives, the theoretical framework expected that teachers face different costs, challenges, and barriers to CPD. Just like incentives, costs and challenges were also expected to influence choices with regard to when to participate in CPD, what content to learn and the learning methods to use. In addition, teachers were expected to face different costs and challenges based on their personal and professional attributes. The study findings supported these expectations.

Majority of the respondents indicated that they were most strongly challenged by costs associated with teacher CPD. The costs are mainly borne by the teachers, either through personal savings or personal loans. Other challenges frequently identified as strong or very strong challenges are lack of time due to heavy teaching work-loads and lack of employer support. The prevalence of these challenges may be due to the lack of financial and non-financial support as well as the lack of policies to guide the allocation of time for CPD. Additionally, the prevalence of cost as a severe challenge may be

attributed to the view that CPD is only legitimate when it is formal yet formal learning activities often imply costs such as participation fees, travel and accommodation etc.

Factor analysis led to the identification of three distinct set of challenges. These are: lack of opportunity and access, (e.g., failing to find relevant CPD), systemic restrictions (e.g., hindrances due to costs, time etc), and personal difficulties (e.g., negative self-evaluation of ability). These challenges to TVET teacher CPD closely resemble the challenges identified in literature, i.e., situational, institutional, and dispositional barriers (Ahl, 2006; Jarvis, 2004; Laal & Laal, 2012). Institutional or structural barriers relate to conditions and procedures that limit participation, and include unavailability learning opportunities, lack of time due conflicting work-schedules or family obligations, lack of study financing etc. Situational barriers are closely related to the life situation of the person and may be affected by the age, gender and location of the individual and include lack of interest or concrete expected results from participating in learning, i.e., available offers are not relevant to the person. Finally, dispositional or individual factors relate to personal qualities such as insufficient self-confidence or beliefs that one is too old to participate. In their study on participation in CPD by Swedish vocational teachers, Andersson & Köpsén (2015) identified similar challenges. In her study, Bükki (2022) found that the biggest barriers to the professional learning of VET teachers in Hungary were the lack of time and a large workload due to a high number of teaching hours and a shortage of teachers.

In this study, differences in the perceived strength of the challenges were found to vary with the personal characteristics of the teachers. Male teachers were found to experience systemic barriers more strongly than female teachers, while teachers with dependents experienced systemic barriers more strongly than those without dependents. This is likely as a consequence of limited income to support families and dependents and yet pay for the costs associated with CPD. Teachers in lower job-groups, many of them who are in their early career stage, were found to have fewer financial resources to pay for their professional development. On the other hand, their more senior colleagues were more likely to have concerns about their ability or feel too old for CPD. This finding was consistent with literature that has previously shown that situational barriers to adult education and learning are more likely to affect younger adults while older adults are more likely to experience dispositional barriers (Laal & Laal, 2012). In

addition, teachers without prior CPD were more likely to perceive challenges with an institutional character, such as finding CPD too expensive or lacking support from their employer. Cedefop (2015a) found that the effects of barriers and challenges to professional development vary with the social economic status and prior educational qualifications of adults.

From a review of the various findings of the study, the list below was compiled to summarize the challenges and constraints that limit effective TVET teacher CPD in Kenya:

a. Lack of an explicit policy on TVET teacher CPD. Further, in the absence of a clear policy, there lacks mechanisms for reporting and tracking participation in teacher CPD and systems to evaluate and improve the quality of TVET teacher CPD.
b. Narrow focus of CPD content, especially limited focus on pedagogical knowledge and pedagogical content knowledge.
c. Use of a small number of learning methods, and in particular limited use of collaborative learning methods and embedded learning activities including Lecturer Industrial Attachment and teacher mentoring.
d. Institutional practices that recognize a limited set of learning practices
e. Failure to motivate and reward TVET teacher CPD and link participation in CPD with career progress
f. Limited time for CPD, financing and other forms of support

The constraints to effectiveness identified above closely resemble challenges identified in previous studies focusing on TVET teachers in developing countries (Grijpstra & Papier, 2015; Rawkins, 2018). Studies focused on the Kenyan context have identified similar challenges (Akala & Changilwa, 2018; Lowe & Prout, 2018; Sifuna, 2020).

The constraints may be attributed to limitations in different forms of capital that characterize developing countries. For example, failure to facilitate, support and reward TVET teacher CPD can be linked to limited financial capital, while lack of opportunities for LIA can be linked to limited physical capital in the form of industries and other workplaces that make use of advanced technology. Similarly, the lack of policies reflects a limited or under-developed framework of formal rules to facilitate TVET teacher CPD. Finally, the lack of a culture to adopt a broad set of learning

methods and focus on diverse content can be looked at as limited human capital in the form of technical knowhow on effective TVET teacher CPD practices. It is was also noted that limitations in different forms of capital reinforce each other and lead to the persistence of the challenges and constraints.

8.7.1 Desired support and participant recommendations

The study also focused on the policies and other institutional practices that could support effective TVET teacher CPD in Kenya. Given the strong burden of cost, the most desired form of support is financial aid to meet the costs associated with CPD. Teachers also strongly desired to be given time-off from teaching for purposes of learning. In addition, the study findings show that women are less likely to receive financial support from their institutes, employer or training providers. With respect to support for their CPD, support came mainly from their families and colleagues, while the administrators and the employer were not deemed as supportive as they could be. This mirrors an earlier finding by David & Bwisa (2013) that secondary school teachers in Kenya felt that their employer and school administrations did not support them engage in CPD. Previous studies have shown that teachers regard the lack of support by administrators as a barrier to participation in teacher CPD. For example, Stanley (2021) found that more than a third of the surveyed vocational teachers in Turkey, Albanian and Tunisia regarded the lack of support by school management as a barrier to participation.

To give voice to the study participants, participants invited to make recommendations for improving TVET teacher CPD in Kenya. The most frequent recommendation was that teacher CPD should be mandatory, scheduled and sponsored. Their desire for regular CPD, even if mandatory, was attributed to the fact that teachers recognize the value of CPD. On the other hand, their desire for sponsored CPD reflects the fact that costs associated with teacher CPD constitute the biggest challenge teachers face in their CPD. Other recommendations were for rewards and incentives for teacher CPD, linking promotions and appointments to participation in CPD and time off to engage in professional development. To create time for CPD a review of the school calendar was called for. And to entrench TVET teacher CPD, developing and implementing policies on TVET teacher CPD was called for.

Similar recommendations have been made. In Eastern Africa, Ahmed (2011) examined the state of in-service teacher programs for TVET teachers in Sudan and the policy innovations that could be implemented to improve TVET teacher training. The study established that an old curriculum on teacher education was still in use while in-service teacher retraining was limited. Other findings included low integration of ICT in teaching and learning processes. Ahmed concluded that it was essential to initiate reforms at the macro and micro levels. Specifically, at the national level, a clear policy on TVET should be developed and implemented, while improving the image and working conditions of teachers. At the level of TVET institutions, it was recommended that administrators support in-service teacher training by carrying training needs assessments and incentivise teachers to participate in Continuing Professional Development.

8.8 Recommendations

The recommendations above reflect to the challenges teachers experience, and their ideas of how to resolve those challenges. Various other recommendations could be made from the study findings. These are discussed below.

A key finding was that TVET teachers in Kenya do not frequently focus their CPD on pedagogical content knowledge and general pedagogical knowledge. Instead, TVET teachers in Kenya appear to find CPD as more impactful if it relates to subject-content knowledge. Unfortunately, limited focus on PCK risks leaving TVET teachers in Kenya with only a limited set of teaching methods and blind to the many useful techniques of teaching the technical subject content knowledge they teach. Since past research has shown that teachers require a diverse set of skills and knowledge, TVET teachers in Kenya should be supported to focus their CPD practices on all domains of TVET teachers' professional knowledge. They should also be supported to appreciate the value of pedagogical content knowledge and made aware of strategies they can use to support the development of subject-specific teaching skills.

Another finding was on the positive role that Initial Teacher Education (ITE) plays in supporting teachers to engage in impactful and effective TVET teacher CPD. ITE for TVET teachers should therefore be leveraged to enhance the breadth and effectiveness of TVET teacher CPD in Kenya. The study findings however showed a need to update

the ITE curriculum to support the development of pedagogical content knowledge, and in particular, subject specific teaching methods. ITE should also be expanded to support TVET teachers develop an appreciation of viable methods of developing pedagogical content knowledge. Further, it is recommended that practicing TVET teachers are sensitized on the value of, and the many avenues of developing these other forms of professional knowledge.

TVET teachers in Kenya were found to use formal academic learning and discussions with colleagues frequently. However, collaborative learning methods and practice-based learning activities are less frequently used. TVET teachers in Kenya were also found to rarely engage in written reflections about practice and its outcomes. Further, the use of professional literature is restricted to text books with limited use of primary and secondary literature. The limited use of active learning methods that involve critical evaluation of practices and their outcomes risks limiting the ability of TVET teachers in Kenya to transform and adopt better practices. TVET teachers in Kenya should therefore be encouraged to engage in active and critical evaluation of their practices as well as critical exploration and adoption of new practices. Teachers should also be encouraged to participate more frequently in curriculum reviews and in the development of teaching and learning materials to help them develop a deeper understanding of the curricular they implement and learning materials they use. It is further recommended that TVET teachers in Kenya are encouraged to adopt a broad conception of teacher CPD that embraces collaborative, reflective, and practice-based learning. This may be achieved by recognizing and rewarding informal learning practices.

A related finding was that TVET teacher CPD practices in Kenya do not fully meet the criteria for effectiveness. It is therefore important that teachers are supported to engage in CPD activities that are spread over longer durations of time and CPD activities that are more collaborative. TVET teachers should also be supported to engage in embedded CPD activities and on-site CPD programmes which tend to be more relevant, active and collaborative. This will ensure that CPD activities fully meet the criteria for effectiveness. The study also revealed a notable portion of teachers whose CPD activities are relatively ineffective and low impact**.** Targeted interventions should therefore be undertaken to support such teachers.

The low rates of participation in Lecturer Industrial Attachment (LIA) put to risk the currency and up-to-datedness of TVET teachers' knowledge of modern technology and work processes. TVET teachers should therefore be encouraged and facilitated to seek LIA to ensure that they keep up to date with developments in industry. A clear policy requiring TVET teachers to attend LIA every year for a minimum of four weeks as suggested by the majority of participants is recommended.

From the findings of the study, it was concluded that examination practices are indeed part of the institutional framework that influences how vocational teachers teach and learn. It is also clear that vocational education is not immune from the pervasive effects of examination practices, and that poorly designed examination practices can have strong and persistent effects. In this particular case, the adoption of a simplified approach to examine practical skills has been found to have led to a narrowing-down of instruction. Further, the interaction of the examination practices, the ITE curriculum for vocational teachers, and available learning resources demonstrates the need to adopt multi-pronged approaches to improve the quality of teaching and learning in TVET. It is therefore recommended that TVET teachers in Kenya are supported to develop practical competencies and the curriculum reviewed to include more relevant content and practical competencies. Further, the mode and focus of student assessment should be changed from summative evaluation to the use of formative evaluation, including student portfolios, to encourage holistic evaluation of students. Finally, it is recommended that the institutions are supported to acquire the required infrastructure and equipment.

8.9 Chapter summary

The aim of this study was to investigate TVET teacher CPD practices in Kenya and use the insights gained from the investigation to identify policy proposals to improve TVET teacher CPD in Kenya. The study was guided by a theoretical framework based on the Adult Learning Framework, the Rational Choice Theory, and adopted a concurrent mixed methods research design.

A preliminary theoretical assumption was that conceptions and held meanings influence human practices, and in particular, the CPD practices of TVET teachers. This assumption was supported wherein the conceptions of who a good teacher is and the

competencies they should possess, were found to influence how TVET teacher CPD is conceptualized and practiced by TVET teachers in Kenya. The Continuing Professional Development of TVET teachers in Kenya is largely conceptualized as, and practiced as, any activity that leads to improved delivery of knowledge and skills to students. These activities include information search, professional dialogue with colleagues and attending workshops and conferences. In line with the view of teaching as work or an occupation, professional development was also interpreted in terms of activities that enable career progress, hence the use of formal education leading to defensible certificates such as university degrees.

In agreement with the theoretical framework TVET teachers in Kenya were found have multiple aims for their CPD. Moreover, they are strategic and selective in their choice of CPD content, learning methods and timing for their CPD. Thus, depending on what the context makes available, teachers time their CPD and choose CPD content and learning methods that enable them to attain their different learning goals. From an analysis of the personal characteristics of teachers, their aims, and decisions with regard to timing, content and learning methods, four teacher CPD orientations were identified, i.e., teacher CPD for task performance competence, teacher CPD for status and authority, teacher CPD for rejuvenation and renewal, and teacher CPD as a requirement.

The aims teachers have for their CPD as well as their CPD practices were thus found to depend on the personal characteristics of teachers and contextual factors. In agreement with the theoretical framework, personal characteristics found to influence teacher CPD practices include: if a teacher has received initial teacher education or not (i.e., prior educational experiences), non-teaching responsibility held, career stage, ability to pay the expenses associated with teacher CPD, and perceived helpfulness of various learning methods.

Contextual factors that were found to influence TVET teacher CPD practices in Kenya include the general availability of learning methods, the availability of learning resources including time, existing policies and institutional practices including how particular practices are conceptualized, expected rewards, and the curriculum and student evaluation practices. Apart from influencing the CPD practices in Kenya, the evaluation system was also found to impact heavily on teaching practices.

In line with the above aims and under the influence of the personal and contextual factors identified above, TVET teachers in Kenya were found to frequently focus their CPD on subject content knowledge and less frequently on pedagogical knowledge. Formal academic learning and discussions with colleagues are frequently used while collaborative learning methods and practice-based learning activities are less frequently used. Less frequently used are informal learning methods such as writing reflections about practice and its outcomes, LIA and mentoring. The use of professional literature is restricted to text books with limited use of primary and secondary literature. CPD activities such as mentoring, supervising other teachers, and school visits were found to form a unique category of CPD activities that is more frequently used by teachers with administrative responsibilities.

It was also established that due to multiple challenges and constraints, the above CPD practices are not always effective as they often do not feature active learning and collaboration, and are not always of sufficient duration. For some teachers, CPD activities are rarely effective and result in limited impact on practice. However, Initial Teacher Education was found to encourage teachers to focus on broader content and to adopt more effective CPD practices.

The challenges and constraints limit the availability and effectiveness of TVET teacher CPD in Kenya and include the lack of an explicit policy framework to guide TVET teacher CPD, lack of financing and other resources including time for CPD, and institutional policies that recognize a limited set of learning methods. Teachers therefore use a limited set of learning methods, and in the absence of a clear policy to guide TVET teacher CPD, there lacks mechanisms for reporting and tracking participation in teacher CPD and systems to evaluate and improve the quality of TVET teacher CPD.

Thus, in offering support and making recommendations, a multipronged approach and well-structured approach is required to address the above challenges. While various recommendation to resolve the above challenges were made in this chapter, the next chapter integrates the findings from the study with wider literature on teacher CPD to identify and propose policy solutions to improve TVET teacher CPD in Kenya.

Chapter 9 Policy Recommendations

This final chapter integrates the findings of the study with wider literature on teacher CPD to propose policies to address the gaps found in the TVET teacher CPD practices in Kenya. The chapter starts with a broad overview of what constitutes policy before presenting the policy proposals. The chapter then closes the dissertation with a highlight of the study's outcomes and its possible limitations.

9.1 Introduction

The third and final objective of this study was to use the insights gained from the study to identify and propose policies to stimulate and guide effective and sustainable TVET teacher CPD in Kenya. This objective was justified by the view that many of the hindrances that limit effective TVET teacher CPD in Kenya can be traced back to the lack of a comprehensive policy framework to guide TVET teacher CPD. Accordingly, and in line with the ontology guiding the study, the study sought, on the one hand, to identify the underlying conditions that hinder effective TVET teacher CPD, and on the other hand, to propose realistic solutions to the hindrances identified.

The previous chapters have shown the value and importance of TVET teacher CPD while noting a wide range of challenges in the provision and uptake of TVET teacher CPD. Many of these challenges have in turn been traced back to the lack of a comprehensive policy framework addressing what content TVET teachers should learn, the methods that can be used, as well as financing and rewarding teachers for their professional development. The absence of a comprehensive policy has resulted in the absence systematic and large-scale provision of TVET teacher CPD in Kenya and TVET teachers left to organize and finance their CPD (Bett, 2016; Lowe & Prout, 2018; UNESCO-UNEVOC, 2018). Because the existing reward practices recognize a limited set of learning methods, teachers favour those methods while avoiding other learning methods that are associated with effective teacher CPD. Moreover, since teachers are not supported to focus their learning on pedagogical knowledge, teachers focus their learning on subject knowledge, leading to the use of a limited set of teaching practices.

The absence of a comprehensive policy has thus led to inadequate TVET teacher CPD. Many teachers are also demotivated from engaging in CPD because they are unable to link career growth to their CPD. The lack of a comprehensive policy also leads to

difficulties in the provision of rational and consistent financing and rewarding of teacher CPD by administrators and policy makers. Finally, since policies suggest legitimacy to practices, many CPD practices that have not been formal proclaimed by policy lack credibility and acceptance. This in turn limits the range of practices teachers feel comfortable using.

It is therefore imperative that systematic solutions to these challenges are developed if effective and sustainable TVET teacher CPD is to be availed to teachers and the dream of quality TVET realized. Since the study findings show that a key hindrance to effective TVET teacher CPD stems from the lack of a comprehensive policy, a key solution to the challenges identified above is the development of a comprehensive policy on TVET teacher CPD. Such a policy would identify and structure practices in a more or less coherent and rational way. It would also codify what is right about existing formal and informal practices, and in so doing lend credibility to such practices and encourage their adoption by more teachers. A clear policy would also prevent possible negative practices and their outcomes.

Before outlining the policy recommendations identified, it is important to first discuss what policy is and how it influences practices.

9.2 Conceptualization of policy

There are multiple ways to view policy with different views focusing on different aspects of policy. Certain views focus on who develops and enacts policy, others on where and how policies are developed, while other views focus on the reasons policies are developed. Finally, critical views focus on the diverse forms polices take as instruments of power.

9.2.1 Policy as a statement of intent

For example, focusing on the reasons policies are developed, Cairney (2012) conceptualizes policy as the legal and institutional framework that guides how a particular public issue is managed and carried out. However, given that many scholars study policies emanating from government institutions, policy often gets conceptualized as what a government intends to do about a particular issue and policy is often defined as the course of action adopted by government (Doherty, 2007; Stewart, 2014). Defined this way, policies take the form of statements of intent by government or formal

directives relating to a specific public issue that a government is dealing with. Policy as a set of directives thus states what ought to be done (or not done) by specified individuals or categories of people specified in the policy. This view of policy as a formal statement of intentions or directives by government is however criticised for being government centric and therefore limiting both conceptually and methodologically (Fimyar, 2014).

A broader view of policy conceptualizes policy as a set of implicit or explicit decisions to guide future decisions (Haddad & Demsky, 1995). Policy thus serves to guide and direct how future decisions are made, initiate or retard action, and guide how previous decisions are implemented. This definition conceives policy as criteria for appropriate action or decisions rather than as prescriptions of procedures that must be followed. This is similar to the view by Ball (2005) that policies do not specify exactly what one should do or not do, rather, they set the goals or outcomes to pursue and identify the range of options available in deciding what to do and how to do it. Thus, policy may be viewed as a set of directives aimed at achieving a long-term goal or objective. The source of the directives could then be an individual, a group or an organization, whether public or private. The directives in pursuit of an objective or a goal differ from a plan in that plans imply specific activities and definite timespans and resources for the outlined activities while policies are ongoing guides towards the attainment of somewhat general and long-term goals. Lauglo (2006) thus defines policy as a combination of relatively stable goals and selected strategies to achieve those goals over an extended period of time while Alkin & Vo (2017) define policies as "general directions for action without necessarily having a particular program or plan in mind". These definitions view policies as statements of what needs to be done to achieve some pre-agreed goals. Emphasizing the role of beliefs in the development of policies, Schlager and Sabatier (1999) recast these definitions of policy, and define policy as the translation of beliefs into desired goals and outcomes and an articulation of how those outcomes can be attained. Schlager and Sabatier (1999) find it important to highlight that the goals and strategies used to purse them are based on beliefs and therefore hints at the value laden nature of policies.

Earlier, I identified policy as a framework of rules, incentives, and sanctions that stimulate and direct desired actions and behaviours and allocate personal and organisational resources (Njenga, 2020c). Policies thus encourage action by providing

incentives and stipulating time-frames within which action must be completed. By threating sanctions for failure to act, polices also demand action from those unwilling to act. Policies thus enforce desired actions by making them independent of the goodwill or inclinations of individuals in the organization (Njenga, 2020c).

The above conception of policy hints at policies as tool of control and therefore tool of power. Aiming to be more comprehensive and to emphasize the role of power in developing and enacting policy, Stewart defines policy as a "the set of basic principles and associated guidelines, formulated and enforced by the governing body of an organization, to direct and limit actions in pursuit of long-term goals" (Stewart, 2014:2). Stewart's definition highlights four key characteristics of policy: the source of the policy, as the formulator, implementer and enforcer; the aim of the policy, as some desired outcomes or solution to a problem; the strategy, as some directives that direct or limit the actions of actors, and; the contents and form of the policy, as a statement intention/goal and basic principles and guidelines for action in pursuit of the goal.

The foregoing conceptualizations of policy depict policies as rational and well-thought-out products of the policy development process. Moreover, the policy development process is depicted as a rational and systematic process initiated by rational and benevolent policy makers seeking to solve public problems. These conceptions of policy have been criticized as being overly positivist in their emphasis of a policy as a product with a specific form and emanating from a specific source. This is seen as a somewhat naïve conception of policy as a value-free tool to solve public problems, policy development as an inherently rational and consensual process with a clear starting point and a clear end, and with the policy process characterized by rational conceptions of the issue being addressed and its solution (Fimyar, 2014).

These criticisms highlight the need to view policy as more than just a formal document outlining intentions and how they will be attained. A holistic view of policy must thus consider the process of its formulation and its implementation as well as the actors in the policy process: their beliefs, agendas, etc., and consequently, the conflictual nature of the policy makes process. Instead of viewing policy as a product, policy should be looked at as a process of agenda setting and the discourses that underlie the process.

As an example, and as an alternative to the overly rational and systematic view of the policy process is the garbage can model of the policy development process. Rather than

well thought out solutions to the most important problems, policies are viewed as fabrications that couple available solutions to the problems that appear amenable to the available solutions. The garbage can is metaphoric of the existence of a mix of problems that need to be solved and solutions available to policy makers. Out of contingency policy makers dip into the garbage can and pick whatever problems and solutions that they find (Fimyar, 2014).

9.2.2 Policy as an exercise of power

More critical views point out the contextual, value-laden, gendered, and political nature of policies and policy development. For example, instead of characterizing policy development as a democratic process whereby different groups debate and come to a consensus, post-structuralists point out the role of power and domination, hence depicting the process as elitist. Feminist may point out the role of gender and characterize policies and policy development as gendered. Marxist scholars may highlight the role policies play in embedding capitalism and social inequalities (Cairney, 2019; Fimyar, 2014).

To highlight the nature of policies as instruments of power and control as well as their value-laden nature, policies have been described as “a web of decision that allocate values” and as “authoritative allocation of values in society” (Fimyar, 2014, p. 10). Since the allocation of values is done by the dominant in society, policy making is thus an exercise of power with policies being instruments of power that guide conduct by actively representing and shaping economic and social systems in particular ways and issuing sets of instructions, requirements and guidance on what to do and how to do it (Doherty, 2007). However, this aspect of policy often gets hidden, with policies represented as tools of doing good and solving public problems.

A more critical view of policies thus seeks to cast open the hidden ways through which policies create power and enable its exercise. Ball (1993, 2005) uses Foucault’s arguments and conceptualizes policy as a power relation, in which power is produced and exercised through the production of truths and knowledge. Policy is thus a discourse in the Foucauldian sense: practices that form the objects that they speak, constituting them and in so doing concealing their intentions. Viewed as discourses, policies are seen as defining what can be thought and articulated, what is appropriate and can be done. They choose who can speak, where and with what authority, and in so

doing, give power to the policy maker to control the conduct of the governed (much without the awareness of the governed and without their resistance to being governed).

The discursive view of policy focuses on the wider process of policy making as a series of interactions between different agents with competing agendas and therefore, the political and value-laden nature of policy, the use of language and power, what policy makers think and incorporate into policy statements, and what they exclude from their thinking (whether such acts are deliberate or not). Ball (2005) also uses the term "policy as text" in conceptualizing policy as representations of agendas. The representations are encoded in complex ways (via e.g., struggles, compromises, authoritative public interpretations and reinterpretations) and decoded in equally complex ways (via e.g., actors, interpretations and meanings in relation to their history, experiences, resources and contexts).

From the foregoing, it is clear that on the surface, policies take the form of statements of intentions and what needs to be done to attain those intentions. Looked at more generally, and putting aside the debates of who, where, and for what purposes policies are made, one can conclude that policies are sets of decisions that guide future decisions. However, a critical view of policy the reveals the need to view policy as more than just a formal document outlining intentions and how they will be attained. Instead, policies take the form of complex entities that encode values and agendas, enable the exercise of power, and reveal the outcomes of conflicts. It is therefore more appropriate to view policies as dynamic compromises between interests and their agendas. And as dynamic compromises, policies are never complete, but rather evolve as values and agendas change.

9.3 Conceptual framework of the policy recommendations

Policy defined as a set of decisions to guide future decisions, implies that policy making involves the laying out of a framework ideas, principles and directives to guide future decisions and the actions emanating from those decisions (Haddad & Demsky, 1995). Identifying that to layout such a framework implies power and control, it would therefore not be appropriate for a work of this nature to purport to be in a position to set a policy. Instead, the work can only offer recommendations on what can be done to improve the professional development of TVET teachers in Kenya based on what has

been observed to take place. The recommendations made support the central value that TVET teacher CPD is invaluable for TVET teachers, their students, and their institutions. Moreover, TVET teacher CPD, like any other form of learning is good for its own sake and should therefore be pursued even when instrumental benefits are not apparent.

With regard to how to view the issue of TVET teacher CPD, this work borrows from Lo Bianco's (1993) characterization of policy orientation. According to Lo Bianco, policy makers can regard a policy issue as a problem, as a question of rights, or as a resource. Policy makers can thus view inadequate CPD as a problem that needs to be eradicated as quickly as possible and at the lowest cost possible. As a right, inadequate teacher CPD implies that the teachers have been denied access to teacher CPD and therefore the government and policy makers need to redress the denial of access to the right. In this case, challenges and hindrances to quality CPD must be resolved. As a resource, teacher CPD takes the instrumental role of serving to support the attainment of other goals, especially improved educational quality and better learning outcomes.

This work adopts all the orientations and argues that inadequate TVET teacher CPD is a problem that requires urgent resolution, that its lack is a denial of opportunity, and that it is a resource that needs to be improved. Accordingly, the government, as an institution for the management of public affairs, has the responsibility to support TVET teacher CPD as a public good. The recommendations thus highlight what the government can and should do to support TVET teacher CPD.

Adopting the view that policies form the legal and institutional framework that guides how a particular public issue is managed, the recommendations below suggest legal and institutional changes to support TVET teacher CPD and address the many challenges that have been identified in the present study and past research. The recommendations also seek to promote good practices, and institutionalize them so that they eventually become the norm, legitimate and expected.

It is also recognized that a given policy is nested in a network of policies. Thus, a given policy may fail simply because the wider institutional framework hinders or at least fails to support that policy. It is therefore necessary to suggest changes in the wider institutional framework. Two sets of recommendations were therefore developed. The

first relates to the lack of a specific policy framework that is supportive of TVET teacher CPD in Kenya, and the second relates to wider institutional factors that hinder TVET teacher CPD.

Several of proposal made are borrowed from different countries. The philosophy guiding the comparison and adoption of polices developed in different countries and contexts is that despite existing social and economic differences, countries share many similarities. Indeed, research results from different regions and countries show more similarities than differences. We can therefore learn from each other and improve our practices by borrowing and adopting best practices from each other.

9.4 Policy recommendations

From the study, different challenges limiting the TVET teacher CPD were identified. A key challenge was the lack of formal rules to guide TVET teacher CPD. This depicts a situation in which policy ambiguity exists. Without an explicit policy and with little or no guidance, teachers have been left on their own to decide if and when to learn, what content to learn and how to learn it. While this can be advantageous in certain instances, the present state of policy ambiguity has led to the above challenges. Policy changes must address the above challenges.

The policy changes should address the policy gaps identified above. Since the third objective of this study was to use the insights gained from the study to identify and propose recommendations to stimulate and guide effective and sustainable TVET teacher CPD in Kenya, the recommendations to be made should address the identified policy gaps. These are summarized in Table 46.

The recommendations follow the observation made earlier that policy recommendations on TVET teacher CPD in Kenya must focus on both the lack of a specific policy framework on teacher CPD and the wider institutional factors that hinder TVET teacher CPD. The recommendations are elaborated in detail below.

Table 46*: Policy recommendations*

Aspect of teacher CPD to address	Policy on TVET Teacher CPD	Related policies
If and when to learn	- Explicit policy on TVET teacher CPD - Specific office to implement policy - Tracking and reporting of learning - Avail resources and time for CPD - Incentives and rewards for learning - Provide appropriate support	Create time for learning by reviewing the school calendar
What to learn	- Statement of core competencies - Online survey of needs, - Support providers to respond to identified & felt learning needs	Curriculum review: - ITE curriculum - Student curriculum - Evaluation practices
How to learn	- Broad statement of learning methods - Recognize and reward diverse methods of learning	Expanded learning opportunities: - Policy on teacher mentorship and induction - Policy on LIA & school-industry partnerships

9.4.1 Policy on TVET teacher CPD

To address the lack of a specific policy framework that is supportive of TVET teacher CPD, and address the many challenges that arise owing to the lack of supportive policies, the following policy recommendations are made:

9.4.1.1 Specific policy on TVET teacher CPD

The starting point to address the challenges identified is to develop a policy on TVET teacher CPD. The policy should form a single document that acts as a point of reference in guiding and supporting TVET teacher CPD. It is important that the policy is developed specifically for TVET teachers. Experience elsewhere, for example in Serbia (Maksimovic, 2016), has shown that when CPD polices are designed for all teachers, CPD requirements and provision fail to respond to the unique needs of TVET teachers (Stanley, 2021).

To ensure that participation in TVET teacher CPD constitutes a core professional requirement, it is imperative that participation in TVET teacher CPD is made mandatory. This will eliminate the current ambiguity relating to if and when teachers should engage in teacher CPD and the form that the CPD learning should take. Without an explicit statement that participation in TVET teachers CPD is mandatory, the current

situation will persist, where TVET teacher CPD is viewed as important and in fact valued, but remains an unpractised ideal. The policy should thus leverage on the positive view of TVET teacher CPD and explicitly state the minimum amount of time TVET teachers should spend on their CPD annually and the sanctions for failing to do so. The policy should further outline how such participation is reported and monitored. To address the question of what content teachers should learn, the policy should identify a wide range of competencies that teachers should develop and the knowledge and skills that underlie those competencies. Similarly, to address the question of which learning methods teachers should use, the policy should, without being prescriptive, recommend a wide range of learning methods. The policy should also provide for the financing and rewarding of participation.

And to ensure that the policy is successfully implemented, the responsibility for enforcing it should be entrusted to a specific department. The department should among other things track participation in TVET teacher CPD, collect and review data the learning needs of TVET teacher CPD, and review available CPD opportunities for TVET teachers.

One key finding was that the learning needs and practices of teachers vary based on the nature their non-teaching responsibilities, prior educational attainment, and if teachers have received initial teacher education. The policy should therefore take into consideration the different qualifications, entry pathways and, work experiences that different TVET teachers have which lead to different CPD needs. Otherwise, broad requirements that do not recognize the differences are likely to lead to frustration and attrition. For example, the recommended content and learning methods may be differentiated for early career stage, middle career stage, and late career stage teachers, and for teachers with different non-teaching responsibilities.

9.4.1.2 Outline key competencies for TVET teachers

One finding was that while teachers identify good teaching skills as an essential competency for TVET teachers, teachers assume mastery of content translates to good teaching skills. Teachers further seem to be unaware that teaching skills (i.e., pedagogical content knowledge) can be developed by learning pedagogical techniques specific to the content they teach. Teachers, as adult learners can only diagnose learning needs in accordance with the competency models that they are aware of and use

(Henschke, 2009). Where the competency model in use does not specify a particular competency, the need to develop the competency will not be felt. Teachers should therefore be encouraged to adopt wide and exhaustive teacher competency models.

To encourage wide and expansive learning, the TVET teacher CPD policy should identify a broad set of competencies for TVET teachers. By identifying a broad set of competencies for TVET teachers and requiring teachers to report CPD activities that seek to develop the diverse set of competencies, the policy will address the problem of teachers adopting a narrow focus on subject content knowledge and ignoring pedagogical knowledge and pedagogical content knowledge.

In line with being supportive rather than being prescriptive, the policy should indicate the different competence milestones of different categories of teachers should achieve, but let teachers decide how to attain those milestones so long as the approaches used meet the criteria set for effective teacher CPD. Such an approach will support teacher autonomy, resulting in commitment to learn and an ambitious view of teaching (Postholm & Wæge, 2016).

9.4.1.3 Provide for and reward diverse methods of learning

TVET teachers in Kenya were also found to use a limited set of learning methods at the expense of other equally helpful learning methods. It is therefore necessary to support and encourage TVET teachers in Kenya to adopt a broader conception of teacher CPD that embraces collaborative, embedded and self-paced learning methods. The policy should therefore identify and reward a diverse set of learning methods and support teachers to use those methods. This should in turn encourage teachers to adopt a broad view of CPD and the wide range of learning methods available to them. Suggesting a wide range of learning methods will solve the problem of teachers being conservative in their view of what constitutes CPD, and possibly encourage them to adopt an equally wide range of teaching methods.

Avis & Orr (2014) refer to the adoption of a wide range of learning methods, in which learning is on-going part of work, as the creation of an "expansive learning environment". They contrast this to a "restrictive learning environment", in which teachers adopt a narrow range of learning approaches, prescribed and imposed learning, and limited opportunities to integrate learning into everyday practice. By recognizing, rewarding, and supporting diverse forms of learning, the policy will thus create an

expansive learning environment characterized by collaborative learning, focusing on learning as a dimension of normal work practice, use of in-school and out-of-school learning, and opportunities to integrate learning into practice. Supporting the emergence of an expansive learning environment is recommended because such a learning environment is self-sustaining and therefore easier to support in the long-run.

Providing for and rewarding a diverse set of learning methods however requires a reworking of the career and professional guidelines which only recognize and reward formal academic learning. In particular, the policy should recognize and reward informal learning methods that are embedded in routine school activities. In so doing, the policy will encourage the adoption of embedded professional development. Such teacher CPD practices have the advantage of being relevant to the immediate needs of teachers while being less costly compared to out of school trainings such as seminars and conferences. Additionally, school-embedded CPD activities are less likely to disrupt the school schedule.

*9.4.1.4 **Monitor and evaluate TVET teacher CPD focusing on the critical features of effective teacher CPD***

Due to the lack of clear policies on TVET teacher CPD, teachers neither document nor report their CPD activities. Further, in the absence of systematic reporting and tracking of learning activities, the quality and effectiveness of teacher CPD activities cannot be evaluated and improved. The policy on TVET teacher should therefore require teachers to record and report their learning activities on a regular basis.

In this regard, teachers and their administrators should be encouraged to document and report all their CPD activities. The policy should thus require teachers to maintain a record of their learning activities. Such a record could be in the form of a learning portfolio. Apart from supporting teachers to monitor their own learning, the use of the portfolios would also enable teachers to objectively report their learning for administrative purposes. The portfolio of teacher learning would thus constitute a reporting tool, which administrators may review as part of policy enforcement.

The study also identified that a significant number of the teachers felt that their prior CPD activities were not spread over a sufficient duration of time and that the activities were rarely collaborative. This suggests that the CPD activities do not fully meet the criteria for effectiveness. It is therefore important that teachers are supported to engage

in CPD activities that are spread over longer durations of time and participate in CPD activities that are more collaborative. Organizers of CPD programs and administrators can leverage on the use of embedded CPD and on-site CPD programmes which tend to be context bound and therefore relevant, active and collaborative, to ensure that CPD programmes meet the criteria for effectiveness.

To encourage freedom and innovation the policy should outline what counts rather than specifying a strict set of learning methods that teachers should use. The policy should thus require that teachers demonstrate their CPD activities meet the criteria for effective teacher CPD (i.e., content focus, active learning, coherence, sufficient duration, collective participation).

By recognizing a wide range of learning methods that teachers can use, and the criteria for what counts as effective, the policy would avoid being prescriptive while supporting innovation in terms of learning methods, and supporting teacher autonomy. This is in line with the view that prescriptive policies tend to fail more often than supportive policies (Brain et al., 2006; Nieuwenhuis et al., 2004).

*9.4.1.5 **Establish a national mechanism to review and update the provision of CPD to teachers***

To ensure relevance and a good match between training offered and the training needs of teachers, the offers must be informed by an up-to-date understanding of the training needs of teachers (Stanley, 2021). Accordingly, to ensure that CPD provision is relevant and responds to the needs of TVET teachers, it is necessary to establish a mechanism to review and update the provision of CPD to TVET teachers. Where the provision of CPD is not reviewed and directed towards existing training needs, CPD provision will likely be unresponsive to those needs. It is therefore important that providers of CPD are encouraged to review and renew their training offers to match exiting and changing learning needs (Stanley, 2021). Similarly, teachers should be supported to clearly identify their learning needs and engage in CPD to address those learning needs.

This can be complemented by the use of annual online training needs surveys as well as online training events. Technology can be leveraged upon to track and respond to TVET teachers training needs. For example, VET teachers in Turkey participate in an annual web-based training needs survey that forms the basis for planning and providing annual in-service training events. As such VET teachers in Turkey regularly attend in-service

training events that directly respond to their training needs (Durgun, 2016). A similar online portal could be developed in Kenya, leveraged on the wide-spread availability of ICT tools in Kenya's TVET institutes. As the results of the study demonstrate, TVET teachers are not shy of using ICT resources for learning. Accordingly, in-service training can also be offered online where appropriate.

9.4.1.6 Incentivise and reward teacher CPD

As observed earlier, (Njenga, 2020c) policies serve as instruments to encourage desired behaviour by offering incentives, setting time-frames for action and threatening sanctions for absconding. However, for policies to be effective, they must offer meaningful incentives, realistic time-frames and sanctions that are humane. In this regard, the TVET teacher CPD policy should offer the right incentives and stipulate conditions that are acceptable and attainable. The study findings point to the desired incentives: many participants in the study attributed low participation rates to lack of motivation and rewards for participating in teacher CPD. On the other hand, promotions and pay increases were the most desired forms of reward for participating in TVET teacher CPD. It is therefore important that the policy address the absence of desired rewards. The policy should incentivise TVET teacher CPD by offering promotions and pay increases to teachers who complete a given amount of learning. Incentives and rewards without budgetary implications may also be offered. Non-monetary incentives include recognition as an expert teacher or appointment to a mentor teacher role among others. If the political environment is supportive, the policy could require CPD for registration and renewal of a teaching license.

The incentives and rewards could be linked with the aforementioned learning portfolios, where teachers who demonstrate completion of a set amount of learning receive a pay increase, a promotion to a higher job-group, or recognition as an expert teacher. Learning may be measured in terms of completed hours of learning or completion of a given number of learning modules.

By rewarding teacher CPD with pay increases, promotions and recognition, teacher CPD will be linked to career progression. Such linking is justified on the basis of offering appropriate incentives for teacher CPD. However, linking teacher CPD to career progression is also supported by other reasons. Two aspects that characterize professions are Continuing Professional Development and career progression, with the

two aspects going hand in hand. It is therefore logical to link TVET teacher CPD to the career progression of TVET teachers as professionals. Moreover, if participation in TVET teacher CPD is made mandatory, participation in TVET teacher CPD should also be linked to the career progression of TVET teachers.

Linking professional development to career growth will also address the professionalization challenge that TVET teaching faces. By ensuring that TVET teaching is characterized by continuing professional development and career progression, TVET teachers will be in a better position to command esteem.

*9.4.1.7 **Avail resources, time and support***

Low participation rates in TVET teacher CPD in Kenya was also attributed to the lack of financial and non-financial support. Indeed, costs associated with TVET teacher CPD were identified as the biggest challenge, and consequently, the most desired form of support was provision of financial support for CPD. Other challenges identified by teachers are the lack of time due to heavy workloads and family obligations. Accordingly, the second most desired form of support is to be allowed to go for study leave, with nearly three quarters of the respondents indicating that they have a strong need for such support. Similarly, two thirds of the respondents desired scheduled time off for CPD, i.e., days off to participate in CPD activities, and longer term paid study leave to attend formal academic programs.

Thus, apart from offering the right incentives, an effective policy must in addition avail the resources needed for TVET teacher CPD. Since many teachers argue that their failure to participate is mainly due to financial challenges, it is important that financial resources are availed. This may take the form of a cost reimbursement model, whereby teachers are reimbursed for costs related to their CPD. Alternatively, an annual allowance for learning could be given to all teachers.

However, not all the challenges and cost are financial. A key challenge is the lack of time, due to heavy teaching workloads, extra duties at school, and family responsibilities. Thus, teachers should be given time for their CPD. Indeed, providing time for CPD plays a critical role in ensuring that teachers have sufficient time for professional development (OECD, 2013). This can take the form of study leaves, whereby annually, teachers can take time off specifically for learning purposes.

Related with giving teachers time for learning is the policy on study leaves. The large proportion of teachers indicating that they do not seek professional development to leave the teaching profession contradicts the fear that teachers often seek formal professional development with the aim of leaving the profession. In light of this finding, the unwritten policy of denying long-term study leave to teachers because of the fear that they will not come back to teaching should be changed.

*9.4.1.8 **Provide appropriate and career stage relevant support***

A key finding was that the learning needs and practices of teachers vary based on their career stages. In addition, teachers in the Early Career Stage, many of who are likely to be in the lower job-groups, were found to have fewer financial resources to pay for their professional development. On the other hand, their more senior colleagues in the Late Career Stage are more likely to face dispositional barriers. This finding was consistent with literature that has previously shown that situational barriers to adult education and learning are more likely to affect younger adults while older adults are more likely to experience dispositional barriers e.g., having concerns about their ability or feel too old to participate (Laal & Laal, 2012). Moreover, according to the theoretical framework, younger teachers have a greater incentive take up learning (on account of larger time based earnings), while previous studies show that adults with higher levels of education are more likely to engage in life-long learning (Cedefop, 2015a, 2015b) .

Taken together, these four facts imply that teachers should be encouraged and supported to seek formal studies early on in their careers. This is because, (a) starting early increases their chances of engaging in life long learning, and (b) Early Career Stage teachers are the ones most in need of financial support; if they fail to get support, they are less likely to start learning and they are therefore more likely to experience dispositional barriers later on. This is not to mean to that Middle and Late Career Stage teachers should not receive financial support or other forms of support. Rather, dealing with situational barriers for Early Career Stage teachers works to reduce the magnitude of dispositional barriers that have to be dealt with later on.

Accordingly, it is important that support be consistent with the different barriers that different categories of teachers face. In the same way, incentives offered to encourage teachers engage in teacher CPD should be linked to and differentiated along age, career stage, and job-group. For example, availing fully paid study leave to ECS teachers,

while Middle and Late Career Stage teachers get 90% and 80% respectively of their salaries while on study leave.

9.4.2 Related policy Changes

To ensure that the wider institutional and policy framework supports the policy recommendations made above, and to address the institutional factors that hinder TVET teacher CPD, the following policy recommendations are made:

9.4.2.1 Reorganize the school calendar to create time for learning

Another finding from the study was the lack of time for CPD, with the current school calendar cited as a factor. Kenya follows a three-term school calendar, whereby schools run for three months with one month breaks in between. The three short breaks are too short and leave little time for rest and CPD. Additionally, activities associated with school opening and closing take time away from teaching and learning.

One possible solution to the lack of time for TVET teacher CPD is therefore to alter the school calendar. By adopting a semester model, whereby teachers and students have a continuous break of three months, teachers will have enough time to attend to their CPD without interrupting their teaching activities. An extended break will also allow enough time for CPD activities that can only be taken over an extended time duration such Lecturer Industrial Attachments (i.e., work placements for teachers). This would avoid the common complaint that teachers abscond their teaching programs to attend trainings or that teachers lack time to take part in training and CPD. Similar arrangements have been successfully carried out in other countries, e.g. Turkey (Durgun, 2016).

9.4.2.2 Review the curriculum and the evaluation system

The predominant view is that the examinations are overly theoretical and examine out-dated content, while having limited practical content. Unfortunately, since students are examined on the "overly theoretical and outdated content with limited practical content", and teachers are rated on how well students perform in examinations based on such content, teachers are incentivized to focus on the examined content and ignore more relevant content and the development of practical skills. This agrees with the theoretical framework: as rational actors, TVET teachers choose to focus their CPD on content that will result in positive outcomes while avoiding sanctions.

Since the evaluation practices are part of the institutional framework, evaluation practices guide teacher agency. It therefore follows that reviewing the examination system is one way of influencing what content teachers choose to learn and the learning methods they use. Conversely, failing to alter the predominant evaluation practices will weaken other policy initiatives on TVET teacher CPD in Kenya.

Given the strong influence of the evaluation system and the co-working of various factors, such as the lack of practical training of TVET teachers and limited infrastructure at the TVCS, a multi-faceted solution is required, whereby teachers are supported to develop the needed practical competencies and the curriculum reviewed to include more relevant content and practical competencies. Further, the mode and focus of student assessment should be changed from summative evaluation to the use of formative evaluation, including student portfolios, to encourage holistic evaluation of students and eliminate the pressure on teachers to produce passes by whatever means. Since the learning and teaching of practical content requires equipment and related infrastructure, it is also recommended that the institutions be supported to acquire the required equipment and infrastructure.

*9.4.2.3 **Reform TVET teacher pre-service education***

Pre-service TVET teacher education has been shown to positively influence the CPD practices of teachers by sensitizing them on the value learning and giving teachers a general orientation to the various forms of teacher knowledge TVET teachers should master. On the other hand, various challenges to TVET teacher CPD have been linked to insufficiencies in TVET teacher pre-service teacher education. It therefore follows that pre-service teacher CPD constitutes an important institutional factor that influences TVET teacher CPD.

Thought of broadly, pre-service teacher education is part of the broader institutional and policy framework that guides and conditions TVET teacher CPD practices. Thus, to improve TVET teacher CPD, it is imperative that pre-service teacher education is reformed. Specifically, the curriculum should be reformed to address the gaps noted, such as limited focus on teaching methods, and expanded to help teachers appreciate the many learning methods available to them.

9.4.2.4 Support Lecturer Industrial Attachment and establish linkages with industry

The study also identified little or no use of Lecturer Industrial Attachment (i.e., where vocational teachers take up work placements in industries and other work places for the purpose of their own learning). Interview participants in the study attributed this to the lack of functional linkages between vocational training institutes and local firms. Others attributed this to the lack of industrial firms in the catchment areas of the vocational training institutes.

The low rates of participation in Lecturer Industrial Attachment (LIA) put to risk the currency and up-to-datedness of TVET teachers' knowledge of modern technology and work processes. Thus, to ensure that TVET teachers in Kenya keep up to date with developments in industry and technology, TVET teachers should be encouraged and facilitated to go for LIA. A clear policy requiring TVET teachers to attend LIA every year for at least four weeks as suggested by the majority of participants is recommended.

Since the limited use of LIA was attributed to lack of functional linkages with industries, it imperative that technical training institutes are supported to form functional linkages with industries where teachers can attend Lecturer Industrial Attachments. Apart from visiting the firms for learning purposes, the firms can be avenues of innovation where teachers attempt to use their technical knowledge to solve the technical problems the firms face. The linkages should be formed in such a way as to encourage collaboration at the level of the teacher, rather than at the level of the institute. Some of the interview participants hinted that past attempts to form such linkages failed because previous attempts tended to focus on the institute rather than on the teacher.

9.4.2.5 Support induction and mentorship

Despite the positive role that mentorship and induction play in supporting the professional development of teachers, this study found that beginning teachers receive little or not mentorship. A key reason identified for the limited mentorship was the lack guidelines to facilitate and guide TVET teacher mentorship. As a consequence, and further limiting the use of mentorship is the failure to allocate sufficient time for intensive mentorship. Other challenges are the over-reliance on superiors as mentors and the use of mentoring as a remedial activity for new teachers experiencing

difficulties in their teaching. These challenges have thus limited the effective use of mentorship to support new and beginning teachers as well for the wider professionalization of TVET teachers in Kenya. Accordingly, to support TVET teacher mentorship in Kenya, a broad framework to guide mentorship and address the identified challenges is called for.

As such, a policy to institutionalize mentorship should also be developed and implemented. Mentorship roles and responsibilities should also be made explicit and delinked from administrative roles. Further, it is recommended that administrators and teachers receive training on the meaning and importance of mentorship as well as on the use of effective mentorship practices.

9.5 Limitations

The multiple findings of the study are informative in their own light. However, the findings should be interpreted taking several limitations into account. One possible limitation relates to the methods used to collect data. While rigor was strived for in developing the data collection instruments, the questionnaire survey and interviews relied on self-reports to collect data. Self-reports and self-assessments of knowledge, ability and past practices may not be exhaustive and can sometimes be inaccurate since individuals tend to be positively biased (van Loon, 2018; Zell & Krizan, 2014). Moreover, since participation was voluntary, findings may reflect biases on this account. Findings should therefore be interpreted while taking these aspects of the data collection methods into account. The reported practices and observations may require confirmation using other methods of data collection. Future studies may use different methods of collecting data that do not rely solely on the recollection of past experiences. To counter the possible downsides from the methods used, findings from both sets of data were compared and used to collaborate each other. The findings therefore likely represent general patterns and a useful indication of existing CPD practices, factors that play a predominant role, and the extent to which teachers find their CPD activities as effective and impactful.

The study focused on the continuing professional development practices of TVET teachers in public Technical and Vocational Colleges (TVCs). Thus, the findings may not be applicable to the whole range of Technical and Vocational Colleges, some of

which are private, community and faith based. Others are specialized government training institutions such as police colleges. Similarly, the findings may not be applicable to Vocational Training Centres (VTCs). Moreover, data could only be gathered from TVET teachers and it was not possible to collect data from government officials responsible for TVET in Kenya or managers responsible for examinations at the Kenya National Examination Council. While the study could have been designed to accommodate a more diverse set of TVET practitioners and TVET institutions, time and cost limited the possible scope of the study. It is also likely that the resulting institutional context would have been too diverse to enable a meaningful and detailed study. In future, similar studies should be carried focusing on the other subsets of TVET institutions and collecting data from other TVET practitioners. Further studies may also expand the scope of the study to different regions and educational levels. The findings however provide a basis for future comparative studies across different regions of the country, educational levels and other countries.

A further limitation relates to the representativeness of the sample. While rigor was strived for in defining and following clear criteria for selecting participants, the representativeness of the sample was limited by the lack data to develop a more sophisticated sampling plan. Further, participants were selected from one region of one country. While the region is diverse and largely representative of the rest of the country, the fact that the data was collected from only one region of a developing country limits the generalizability of the results to other contexts. The findings of the study should therefore be interpreted taking these limitations into account. However, because the career and professional guidelines that all teachers in public TVET institutes are largely the same and result in the same set of behaviour incentives, the above limitation are not necessarily severe. It is therefore important that in future similar studies are carried out in different regions and using different methods to on the one hand expand the knowledge base about TVET teachers in Kenya, but to also confirm the findings of the study.

Recent policy changes may also limit the validity of the results. The new Competency Based curriculum requires that more practical content is covered, and that the curriculum is implemented in modules. Given the scope of the study, and the fact that the new curriculum was implemented when the study was ongoing, it was not possible

to study how these changes have affected teaching and learning in the TVCs institutes. Further research in the context of the new modular based curriculum is therefore called for.

9.6 Summary

This study sought to investigate the Continuing Professional Development practices of TVET teachers in Kenya. On the basis of its findings and reviewed literature, the study further sought to identify and propose policies that can sustainably ensure effective TVET teacher CPD in Kenya. The study adopted a concurrent mixed methods approach involving a questionnaire survey and oral interviews targeting teachers in six Technical and Vocational Colleges in Kenya's Nairobi Metropolitan Area.

Based on the collected data, the study provides a description of TVET teachers in Kenya and their characteristics, including their distribution with respect to age and gender, initial teacher education, prior work experiences and career stages. It also identified how TVET teachers in Kenya conceptualize TVET teaching and TVET teacher CPD. In addition, the study identified how these conceptions influence TVET teacher CPD practices, including the decision to participate in CPD, what content to learn and how to learn it. The study thus described TVET teacher CPD practices in terms of the content teachers learn and the learning methods that TVET teachers use, identifying the frequently covered content areas and the most common as well as the least common learning methods used. Findings further detail motives that underlie TVET teacher CPD practices in Kenya, and by collating the motives with the associated learning methods, CPD content, timing for CPD and teacher characteristics, the study identified four orientations towards TVET teacher CPD in Kenya.

In line with the ontology guiding the study, one conclusion drawn from the above findings was that while "observable" actions characterize practices, the aims underlying the practices as well as the conceptions of what is being done and how it should be done are an integral part of the practices. Changing, or at least improving, practices must also involve an alteration of the underlying aims and conceptions that underly the practices.

This led to the recommendation for a review of the curricula that TVET teachers go through during their training to help new teachers develop a broader conception of TVET teachers' professional competency and the avenues through which they may

develop their professional competencies. Similarly, it was recommended that practicing TVET teachers get supported to critically examine their conceptions of professional competency and professional development, as well as get sensitized on the value of pedagogical content knowledge and the avenues available to them in developing subject specific teaching skills. Another avenue recommended for altering existing conceptions and aims of teacher CPD was to alter the set of rewards and incentives teachers face such that the incentives and rewards suggest and lead to aims and conceptions that encourage more effective TVET teacher CPD practices. This may be achieved by reviewing the policies and professional guidelines that guide teachers, and in this particular case, by developing a policy framework on TVET teacher CPD.

TVET teacher CPD practices were also observed to be influenced by the characteristics of teachers, and in particular by their learning needs. This led to the recommendation to align CPD programs with the characteristics of teachers, and to ensure that available learning opportunities respond to the learning needs of TVET teachers. To ensure that CPD programmes align with the learning needs of teachers, regular monitoring and evaluation of CPD programmes and available learning opportunities was recommended.

TVET teacher CPD practices were also observed to be influenced by contextual factors, and in particular by institutional practices. To ensure that institutional practices support effective TVET teacher CPD practices, a comprehensive policy on TVET teacher CPD was recommended.

The study also investigated and identified challenges and constraints associated with TVET teacher CPD in Kenya. The challenges and constraints were traced in part to limitations in different forms of capital that characterize Kenya as a developing country. One recurring constraint is the lack of an appropriate institutional framework to support TVET teacher CPD. This agrees well with the preliminary assumption that absences also influence practices and their outcomes. This finding further supported the conclusion that a need exists to develop a policy on the continuing professional development of TVET teachers in Kenya. The study recommendations therefore centre on the development of a comprehensive policy framework on TVET teacher CPD as well as a review of related policies. Drawing from the study findings and diverse literature on teacher CPD, various recommendations to improve TVET teacher CPD in Kenya were identified and formulated as policy proposals.

The study therefore addresses an existing knowledge gap on TVET teacher CPD practices in Kenya while providing practical recommendation to improve the practices. While various limitations were identified, such as the limited scope of the study, these were not deemed fatal to the conclusions arrived at. However, future studies involving a wider set of TVET practitioners and utilizing a broader set of data collection methods are recommended. Future studies may also explore appropriate strategies of helping TVET teachers develop a critical awareness of their professional competency as well as the effects of such awareness on their continuing professional development practices.

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Appendices

Appendix 1: Interview schedule

Continuing Professional Development of TVET Teachers in Kenya
Interview Schedule

Informed Consent and Description of Research

You are invited to participate in a research coordinated by Prof. Dr. Peter Toth. The research is carried out by highly qualified psychologists/pedagogues and their assistants. The aim of this study is to investigate continuing professional development practices of TVET teachers in Kenya and identify policies that can sustainably ensure effective continuing professional development of TVET teachers in Kenya.

Participation is voluntary. Filling out the questionnaires and/or participating in the interview are harmless and without any foreseen risks. It is possible to suspend participation so that it should not be tiresome. It is also possible to withdraw consent and terminate participation at any time without any reason and without any consequences. Monetary compensation is **not due** for participation.

The results of this study later may be used in publications and will also be presented at scientific conferences. If requested, written or verbal information will be provided on these events.

All information (including audio material from the interview) collected during this research will be handled with strict confidentially. Data obtained during the research is stored as coded information on a secure computer and paper-based material (e.g. questionnaires) is kept in a safe or a locked office also in a coded format. The individual codes are provided by the assistant in charge, and these are accessible and known only to her/him. Data of the research are analyzed statistically during which no personal identification is possible. The document with the rules regulating personal data processing (General Data Protection Regulation, GDPR) is attached with its enclosures.

No medical or laboratory report will be prepared about the results of the study. Verbal account can be provided about the findings upon request.

Please sign the agreement below if you agree with the conditions outlined above and endorse participation in the study. We thank you for your collaboration.

I…….… declare that I was given thorough information regarding the circumstances of my participation in the present research. I agree with the conditions and to participate in the study. I also give my consent to use the anonymous data collected during this process so that these may be accessible to other researchers. I reserve the right to terminate my participation at any time in which case the data belonging to my person should be erased.

I am not (and have not been) treated for any kind of neurological or mental disease.

ELTE PPK Doctoral School of Education *as data processor handles my above personal data confidentially and does not allow access to these for other data processing or data analyzing organizations of any kind. Details of this statement are found in the "Information on Processing of Data (GDPR)" which I agree with as proven by my signature.*

…… …….

Date Signature

Note: This declaration will be kept separate from the rest of the interview and will not be accessed during data analysis. Your privacy is assured.

TVET Teacher Continuing Professional Development Survey Questionnaire

Please provide some basic information about yourself.

1. What is your gender?

Male	Female

2. What is your age?

20- 25 years	26 - 30 years	31-35 yeas	36 - 40 years	41-45 years	46- 50 years	51-55 years	55- 60 years

3. What is your marital status?

Single	Married	Separated

4. Do you have children?

Yes	No

5. How many years have you worked as a teacher?

0-2 years	3-5 years	6-10 years	11-15 years	16-20 years	21-25 years	26- 30 years	More than 30 years

6. What is your current job group?

J	K	L	M	N	O	P	Q	Other

7. What is your teaching area/department?
   - ○ Engineering
     - ○ Mechanical, ○ Electrical ○ Automotive, ○ Civil
   - ○ Business, Accounting and Management Studies
   - ○ Catering and Hotel Operations
   - ○ Clothing and Textiles
   - ○ Information and Communication Technologies (ICT)
   - ○ Sciences and Laboratory Technology
   - ○ Languages and communication skills
   - ○ Mathematics

8. Which level of students do you normally teach?

   - □ Mainly Craft students
   - □ Mainly Diploma students
   - □ Both Craft and Diploma students

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PPK/ELTE Ethical Permission No.: 2019/243

TVET Teacher Continuing Professional Development Interview Schedule

Research Questions	**Interview Question**
What meanings are held by teachers about teaching and teacher learning? How do the held meanings influence CPD practices?	a. What do you think it means to be a teacher?
	b. What do you think continuing professional development means?
	c. How do you define yourself as a professional teacher? d. What kind of knowledge and skills (SCK, GPK, and PCK) should teachers have? e. As a professional teacher, what kind of professional development do you think you should have? f. What competences do you feel you need the most? g. How do you compare yourself, in terms of teaching competences before you became a teacher and now? h. Have you improved? Why do you feel that way?
How do TVET teachers in Kenya practice Continuing Professional Development?	a. What forms of professional development do you normally engage in? Give me some examples. b. What about your colleagues? c. Why do you choose to learn that way?
What motivates them to engage in CPD? (intrinsic vs. extrinsic motivation)	d. What motivates you to learn and improve your competencies? e. What outcomes do you seek to get? Why those outcomes? f. What about promotions, or salary increments?
What are the benefits derived?	g. What are some of the specific benefits that you can say you got from your professional learning activities? h. Why do you think you got only those outcomes?
How does the examination system influence CPD practices.	i. Do you think KNEC examinations focus on relevant content? j. How does the examination system influence what you teach? k. How does the examination system influence how your professional development?

What are the costs faced?	l. What are some of the costs that you have had to meet for your professional development? m. How did you meet those costs? n. What are some other challenges that you have had to deal with? o. How did you deal with those challenges?
What are the challenges faced?	a. What are some other challenges that you have had to deal with? b. How did you deal with those challenges?
What role does the institute's administration play?	c. What kind of support have you received from your colleagues? d. Why do you think they give this kind of support? Or do not give other forms of support?
	e. What kind of support have you received from the administration of the institute? Give me some examples. f. What more do you think the administration could do to help you continuing professional development? g. What limits the support availed to teachers?
What role does the school culture play?	h. How does the culture of the institution influence your continuing professional development?
How do personal and professional attributes (gender, age, marital status, ITE, job group, years of service (career stage), and professional responsibilities) influence engagement with available CPD opportunities?	a. How does your family, marital status etc. influence your CPD?
	b. What about your students? How do they influence what and how you learn?
	c. How does your age and job group, etc. influence the professional development you choose? d. Why do you think this is the case? e. What do you think influences the professional development of your colleagues?
	f. What kind of commitments do you have out of school? g. How do they influence your professional development?
	h. Do you have non-teaching responsibilities here in the school?

	i. How does the responsibility support or hinder you from learning?
	j. What other personal or professional attribute influence the professional development that you choose?
What do teachers think about formal continuing professional development activities?	a. In the past one year, what formal PD activities have you participated in (e.g. Workshops and conferences)? b. How helpful did you find these types of trainings to be? c. Why do you feel that way?
What do teachers think about informal continuing professional development activities?	d. In the past one year, what informal/practice based PD activities have you participated in (being coached, lesson observations, written self reflection etc.)? e. Are these types of activities common in your institution? Why is this the case? f. How helpful did you find these PD is? g. Why do you feel that way?
What do teachers think about collaborative professional development activities?	h. Do you engage in collaborative teaching activities? Give me some examples of how those activities take place. i. Are these activities common? If not, why? j. Some research suggests that collaborative learning is rare. In your experience is this true? Why?
	k. What about mentoring and coaching? Could you describe this kind of activities to me? l. How helpful do you find these kinds of CPD to be? Why? m. Would you say mentoring and coaching is common or not common? Why?
	n. Have you ever worked with teachers from other institutions as a form of PD? Describe this kind of PD. o. How helpful did you find these PD is? p. Why do you feel that way?

What do teachers think about embedded professional development activities?	q. How often do you read or watch videos about teaching or your subject just for the sake of it? Without a focus on lesson preparation? r. How helpful did you find these types of learning to be? s. Why do you feel that way?
What do teachers think about lecturer industrial attachment?	t. What is your view of Lecturer Industrial attachment? Have you done it before? u. How helpful did you find these kinds of trainings to be? v. How do you think LIA should be organized? (Duration, frequency, types of industries)
What CPD policies (guidelines, incentives, sanctions, timeframes, and career outcomes) can create a sustainable and functional TVET teacher CPD in Kenya?	If you were to propose polices and rules to guide CPD of TVET teachers, what rules and policies would you propose at the level of the Institute?
	If you were to propose polices and rules to guide CPD of TVET teachers, what rules and policies would you propose? At the national level?
Maybe there is something I haven't asked about teachers' professional learning? What else can you tell me?	

Appendix 2: Questionnaire

Continuing Professional Development of TVET Teachers in Kenya Questionnaire

Informed Consent and Description of Research

Dear Participant,

You are about to participate in survey focusing on your Continuing Professional Development as a TVET lecturer. The survey is part of a larger project to develop policies to guide the Continuing Professional Development of TVET lecturers in Kenya. The research is coordinated by Prof. Dr. Peter Toth, a researcher from Eotvos Lorand University in Budapest. He is assisted by his PhD student, Moses Njenga.

The research has ethical approval from the Ethical Committee of the Faculty of Pedagogy and Psychology at Eotvos Lorand University. The research has also been permitted in Kenya by the National Council for Science and Technology (PPK/ELTE Ethical Permission No.: 2019/243, NACOSTI Licence No.: BAHAMAS ABS/P/20/7651).

Participation is voluntary. Filling out the survey is harmless and without any foreseen risks. All information collected during this research will be handled with strict confidentiality.

Please sign the agreement below if you agree with the conditions outlined above and endorse participation in the study. We thank you for your collaboration.

I…… declare that I was given thorough information regarding the circumstances of my participation in the present research. I agree with the conditions and to participate in the study. I also give my consent to use the anonymous data collected during this process so that these may be accessible to other researchers. I reserve the right to terminate my participation at any time in which case the data belonging to my person should be erased.

…… ……

Date Signature

Note: This declaration will be kept separate from the rest of the questionnaire and will not be accessed during data analysis. Your privacy is assured.

TVET Lecturer Continuing Professional Development Survey Questionnaire

Biographical Information

Please provide some basic information about yourself.

9. What is your gender?

Male	Female

10. What is your age?

20- 25 years	26 - 30 years	31-35 yeas	36 - 40 years	41-45 years	46- 50 years	51-55 years	55- 60 years

11. What is your marital status?

Single	Married	Separated

12. Do you have children?

Yes	No

13. How many years have you worked as a teacher?

0-2 years	3-5 years	6-10 years	11-15 years	16-20 years	21-25 years	26- 30 years	More than 30 years

14. What is your current job group?

J	K	L	M	N	O	P	Q	Other

15. What is your teaching area/department?
    - ○ Engineering
        - ○ Mechanical, ○ Electrical ○ Automotive, ○ Civil
    - ○ Business, Accounting and Management Studies
    - ○ Catering and Hotel Operations
    - ○ Clothing and Textiles
    - ○ Information and Communication Technologies (ICT)
    - ○ Sciences and Laboratory Technology
    - ○ Languages and communication skills
    - ○ Mathematics

16. Which level of students do you normally teach?
    - □ Mainly Craft students
    - □ Mainly Diploma students

□ Both Craft and Diploma students

17. What are your non-teaching responsibilities in the institute?
    - None
    - Principal
    - Deputy Principal
    - Head of Department
    - Head of Section
    - Sports
    - Guidance and Counselling
    - Librarian
    - Other

18. What prior work experience did you have before you became a teacher?

I had no prior experience	I was employed	I was self employed

19. Was your prior work experience before you became a teacher related to your teaching subjects?

Yes	No	I did not have prior work experience before I became a teacher

20. When did you receive initial pedagogical training for teachers?

Before I was employed as a teacher	After I was employed as a teacher	I have not received any pedagogical training for teachers

21. What were your entry qualifications into teaching?

Diploma	Bachelors	Masters	PhD

22. What is your highest level of education now?

Diploma	Bachelors	Masters	PhD

23. If you have a Masters or a PhD, did you change your specialization from your initial subject specialization? (e.g. from Automotive engineering to Educational administration)
    - I do not have a masters or a PhD
    - Yes, I changed my specialization
    - No, I did not change my specialization
    - If yes, what is your current specialization

_____

Past CPD Activities

Please provide some information about your continuing professional development

24. On a scale of one to five, how confident do you feel about your teacher professional knowledge and competencies with regard to:

Competence	**Self rating of competence**				
	None	**Small**	**Moderate**	**High**	**V. High**
a. Subject-content knowledge (knowledge and skills specific to my field)	[1]	[2]	[3]	[4]	[5]
b. Teaching methods (e.g. lesson planning etc.)	[1]	[2]	[3]	[4]	[5]
c. General Educational Knowledge	[1]	[2]	[3]	[4]	[5]

25. On a scale of one to five, how much do you need the following teacher professional development with regard to:

Need for professional development on:	**Magnitude of need**				
	None	**Small**	**Moderate**	**High**	**V. High**
a. Subject-content knowledge (knowledge and skills specific to my field)	[1]	[2]	[3]	[4]	[5]
b. New technologies in the work place	[1]	[2]	[3]	[4]	[5]
c. Pedagogical Content Knowledge (teaching methods specific to my field)	[1]	[2]	[3]	[4]	[5]
d. ICT skills for teaching	[1]	[2]	[3]	[4]	[5]
e. Knowledge of learners and their characteristics	[1]	[2]	[3]	[4]	[5]
f. Student evaluation and assessment	[1]	[2]	[3]	[4]	[5]
g. Knowledge of educational goals, purposes and values	[1]	[2]	[3]	[4]	[5]
h. Curriculum theory and development	[1]	[2]	[3]	[4]	[5]
i. Guidance and Counselling	[1]	[2]	[3]	[4]	[5]
j. School management and administration	[1]	[2]	[3]	[4]	[5]

26. How many times have you participated in the following collaborative professional development activities in the past?

Number of times I participated in:	**Never**	**Once (One time)**	**Two or more times**
a) Co-teaching(teaching the same lesson with another teacher)	○	○	○
b) Lesson observations (Lesson study with other teachers)	○	○	○
c) Mentoring and coaching of other teachers	○	○	○
d) Participation in teacher clubs	○	○	○
e) Visiting other institutes and schools to observe their teaching	○	○	○
f) Supervising other teachers	○	○	○

27. How many times have you participated in the following formal professional development activities in the past?

Number of times I participated in:	Never	Once (One time)	Two or more times
a) College and university courses	○	○	○
b) Short training courses	○	○	○
c) Online courses	○	○	○
d) Workshops and Seminars	○	○	○
e) Educational conferences	○	○	○

28. How many times have you participated in the following informal and practice-based professional development activities in the past?

Number of times I participated in:	Never	Once (One time)	Two or more times
a) Lecturer Industrial Attachment	○	○	○
b) Design and improving content, materials and practices	○	○	○
c) Writing reflections about practice and their outcomes	○	○	○
d) Being involved in research activities	○	○	○
e) Curriculum development	○	○	○
f) Development or marking of national exams	○	○	○

29. How often do you do any of the following self-paced professional learning activities?

Number of times I participated in:	Never	Rarely	Occasionally	Frequently	Very Frequently
a) Discussions about teaching practices with other teachers	○	○	○	○	○
b) Watch videos about teaching methods and practices	○	○	○	○	○
c) Read about my teaching subjects	○	○	○	○	○
d) Watch videos about my subjects	○	○	○	○	○
e) Read about educational theory	○	○	○	○	○

30. How often do your read the following types of professional literature?

Number of times I participated in:	Never	Rarely	Occasionally	Frequently	Very Frequently
a) Primary Literature (i.e. original research journals)	○	○	○	○	○
b) Secondary Literature (Review articles, practice guidelines etc.)	○	○	○	○	○
c) Tertiary Literature (Textbooks, Handbooks, encyclopaedias etc.)	○	○	○	○	○
d) Grey Literature (e.g. Policy and curriculum documents etc.)	○	○	○	○	○

31. What is your aim in reading such literature? *(Please tick all that apply)*

□ Keep my knowledge up to date
□ As part of my work.
□ As part of my Masters or PhD studies
□ I am involved in research

Influence of the Examination System

Please provide some information about the examination system and your professional development and teaching practices.

32. How strongly do you agree with the following statements with regard to the examination system and your teaching practices?

Agreement with statement:	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
d) KNEC examinations focus mainly on theoretical content	○	○	○	○	○
e) KNEC examinations are regularly updated to reflect technological progress	○	○	○	○	○
f) KNEC examinations examine practical skills sufficiently	○	○	○	○	○
g) I teach content that is most likely to be examined	○	○	○	○	○
h) I rarely teach practical skills	○	○	○	○	○
i) I choose to learn knowledge most likely to help my students pass	○	○	○	○	○
j) I do not learn practical skills	○	○	○	○	○

Lecturer Industrial Attachment

The following questions focus on Lecturer Industrial Attachment (i.e. when lectures/teachers work in an industry or business as part of their professional development.)

33. How strongly do you agree with the following statements with regard to Lecturer Industrial Attachment?

Agreement with statement:	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
a) Industrial attachments are important for TVET teachers.	○	○	○	○	○
b) I wish to attend an industrial attachment for TVET teachers.	○	○	○	○	○
c) I am willing to pay to attend an industrial attachment.	○	○	○	○	○

34. How often should TVET teachers go for lecturer industrial attachment?

Every six months	Once an year	Once every two years	Once every three years	Once every five years	Never

35. How long should the lecturer industrial attachment last?

Two weeks	Four weeks	Six weeks	Eight weeks	Twelve weeks

CPD Content

Please provide some information about the content of your prior learning activities

36. Based on the professional development activities you participated in the past, what topics did you actually learn? How much impact did they have on your teaching?

Professional development topics	**If topic was learnt**		**Impact of topic on my teaching**				
	Yes	**No**	**None**	**Small**	**Moderate**	**High**	**V. High**
a) Subject-content knowledge (knowledge and skills specific to my field)	○	○	○	○	○	○	○
b) New technologies in the work place	○	○	○	○	○	○	○
c) Pedagogical Content knowledge (teaching methods specific to my field)	○	○	○	○	○	○	○
d) ICT skills for teaching	○	○	○	○	○	○	○
e) Knowledge of learners and their characteristics	○	○	○	○	○	○	○
f) Student evaluation and assessment	○	○	○	○	○	○	○
g) Knowledge of educational goals, purposes and values	○	○	○	○	○	○	○
h) Curriculum theory and development	○	○	○	○	○	○	○
i) Guidance and Counselling	○	○	○	○	○	○	○
j) School management and administration	○	○	○	○	○	○	○

Effectiveness of past CPD

Please rate your professional development activities for the following criteria:

37. My professional development activities involved the following:

Characteristic	**Not in any of the activities**	**In a few of the activities**	**In some activities**	**In most activities**	**In all the activities**
a) The content was relevant to my work as a teacher	○	○	○	○	○
b) The content was coherent and well organized	○	○	○	○	○
c) We were a group of teachers	○	○	○	○	○

d) Active and interactive learning (not just lectures)	○	○	○	○	○
e) Collaborative learning activities with other teachers	○	○	○	○	○
f) Sufficient duration (several occasions spread over weeks or months)	○	○	○	○	○

Outcomes and Benefits

Please provide some information about the outcomes of you professional learning activities

38. How do you incorporate what you learn in your teaching?

Effects of professional development on my teaching:	**Impact of professional development on my teaching**				
	None	**Small**	**Moderate**	**High**	**Very High**
a) I update the content I teach in class	○	○	○	○	○
b) I provide demonstrations during practical lessons	○	○	○	○	○
c) I use different teaching methods	○	○	○	○	○
d) I use more effective student assessment methods	○	○	○	○	○
e) I deal with classroom challenges more effectively	○	○	○	○	○
f) I collaborate with other teachers more	○	○	○	○	○

Motives for participation

39. What motivates you to learn as a teacher?

Motivation for my professional development:	**Magnitude of motivation**				
	None	**Small**	**Moderate**	**High**	**Very High**
a) Improve my teaching skills	○	○	○	○	○
b) Improve my subject knowledge	○	○	○	○	○
c) Improve my students' performance	○	○	○	○	○
d) Career progress (e.g. promotions)	○	○	○	○	○
e) Career change (leave teaching)	○	○	○	○	○
f) Personal satisfaction	○	○	○	○	○

Benefits from past CPD

40. What benefits have you received from your professional learning activities*?*

Benefits obtained for my professional development:	**Magnitude of benefit**				
	None	**Small**	**Moderate**	**High**	**Very High**
a) Improved student performance in national examinations	○	○	○	○	○
b) Improved teaching skills	○	○	○	○	○

c) Improved confidence in myself as a teacher	○	○	○	○	○
d) Career progress/promotion	○	○	○	○	○
e) Appointment in a managerial position	○	○	○	○	○
f) Improved respect from my colleagues	○	○	○	○	○

Costs and Challenges

Please provide some information about the cost and challenges you face in your learning as a teacher.

41. What are the costs that you had to pay for the professional learning activities you undertook?

Costs for my professional development:	**Magnitude of cost**				
	None	**Small**	**Moderate**	**High**	**Very High**
a) Tuition fees	○	○	○	○	○
b) Attendance and participation fees	○	○	○	○	○
c) Transport and accommodation fees	○	○	○	○	○
d) Buying learning materials	○	○	○	○	○
e) Time away from my work (work backlog)	○	○	○	○	○
f) Time away from my family	○	○	○	○	○

42. Who paid for the monetary costs associated with your learning*? (Please tick all that apply)*

- □ Myself using my personal savings
- □ Myself using a personal loan
- □ My spouse
- □ Institute
- □ Employer or other government institution
- □ Training Provider e.g. scholarship

Challenges

43. How strongly do the following challenges limit your continuing professional development?

Type of Challenge	**Magnitude of Challenge**				
	Not a Challenge	**Slight Challenge**	**Moderate challenge**	**Strong Challenge**	**Very Strong challenge**
a) Cost, it is too expensive	○	○	○	○	○
b) Workload, I have too much work here at the institute	○	○	○	○	○
c) Lack of time due to family obligations	○	○	○	○	○
d) Lack of employer support	○	○	○	○	○
e) Lack of prerequisite qualifications and experience	○	○	○	○	○

f) No relevant professional development is offered	○	○	○	○	○
g) Lack of access to necessary ICT facilities	○	○	○	○	○
h) No training within reachable distance	○	○	○	○	○
i) Feeling too old to participate	○	○	○	○	○

Effect of non-teaching responsibilities

44. How do your non-teaching responsibilities influence your professional learning?

Effect of my non-teaching responsibilities on my professional development:	**Magnitude of effect**				
	None	**Small**	**Moderate**	**High**	**Very High**
a) I have less time for learning	○	○	○	○	○
b) I have more time to learn	○	○	○	○	○
c) I get involved in activities that help me to learn new things	○	○	○	○	○
d) I get to attend conferences and other learning opportunities	○	○	○	○	○

Please provide some information on the support you get from your institute and colleagues. ***(Remember, all information provided is confidential.)***

Mentorship/supporting others

45. How do you support other teachers to learn?

How I support other teachers in their professional development:	**Magnitude of support offered to other teachers**				
	None	**Small**	**Moderate**	**High**	**Very High**
a) I advise new and junior teachers	○	○	○	○	○
b) I participate in discussions about practice	○	○	○	○	○
c) I teach lessons for other teachers when they attend professional learning activities	○	○	○	○	○
d) I allow other teachers to observe my lessons	○	○	○	○	○
e) I participate in co-teaching	○	○	○	○	○

46. How supportive to your continuing professional development are the following:

	Very Unsupportive	**Unsupportive**	**Supportive**	**Fairly Supportive**	**Very Supportive**
a) Family members	○	○	○	○	○
b) Colleagues	○	○	○	○	○
c) School administration	○	○	○	○	○
d) Employer	○	○	○	○	○

47. What support would you wish to receive?

Form of support I need for my professional development:	Magnitude of need for support				
	None	Small	Moderate	High	Very High
a) Financial support to meet costs of my professional learning activities	○	○	○	○	○
b) Reduction in workload	○	○	○	○	○
c) Substitute teacher for when I am away on professional learning activities	○	○	○	○	○
d) Days off to participate in professional learning	○	○	○	○	○
e) Study leave	○	○	○	○	○

Policies

46. How strongly do you agree with the following statements with regard to the current regulations and policies on the continuing professional development of teachers in Kenya?

Agreement with statement:	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
a) I am familiar with the current policies on the professional development of teachers.	○	○	○	○	○
b) The current policies are clear and easily understood.	○	○	○	○	○
c) Current policies are adequate and effective	○	○	○	○	○
d) Current policies need to be reviewed.	○	○	○	○	○
e) There are no policies.	○	○	○	○	○

47. What government regulations would you propose to encourage TVET teachers to participate in continuing professional development?

_____

_____

48. What rules within the institute would you propose to encourage continuous professional learning?

_____

_____

Appendix 3: Registered public Vocational Training Colleges (VTC) in the Nairobi Metropolitan Area

	Registered Public Vocational Training Colleges in the Nairobi Metropolitan Area (Kajiado, Kiambu, Machakos, Murang'a and Nairobi Counties) Data obtained from TVETA (https://www.tveta.go.ke/institutions/) on 27th March 2019			
No	**Institution Name**	**Category**	**Type**	**County**
786	Masai Technical Training Institute	TVC	Public	Kajiado
1.12	Ruiru Gikonyo Memorial Institute for Technical Skills	TVC	Public	Kajiado
582	Kiambu Institute of Science and Technology	TVC	Public	Kiambu
1.306	Thika Technical Training Institute	TVC	Public	Kiambu
484	Katine Technical Training Institute	TVC	Public	Machakos
741	Machakos Technical Institute for the Blind	TVC	Public	Machakos
1.02	NYS Yatta School of Agriculture	TVC	Public	Machakos
314	Gatanga Technical Vocational College	TVC	Public	Murang'a
795	Mathioya Technical Vocational College	TVC	Public	Murang'a
830	Michuki Technical Training Institute	TVC	Public	Murang'a
17	Administration Police Training College	TVC	Public	Nairobi
64	Animal Health & Industry Training Institute (AHITI) – Kabete	TVC	Public	Nairobi
153	Centre for Tourism Training and Research	TVC	Public	Nairobi
210	Defence Forces Technical College (DEFTEC)	TVC	Public	Nairobi
218	Directorate of Criminal Investigations Academy	TVC	Public	Nairobi
240	East African School of Aviation	TVC	Public	Nairobi
346	GSU Training School (Kenya Police Service)	TVC	Public	Nairobi
374	Institute for Meteorological Training and Research	TVC	Public	Nairobi
381	Institute of Energy Studies and Research	TVC	Public	Nairobi
474	Karen Technical Training Institute for the Deaf	TVC	Public	Nairobi
547	Kenya Institute of Surveying and Mapping	TVC	Public	Nairobi
559	Kenya School of Monetary Studies	TVC	Public	Nairobi
562	Kenya Technical Trainers College	NP	Public	Nairobi
563	Kenya Water Institute	TVC	Public	Nairobi
820	Meat Training Institute	TVC	Public	Nairobi
864	Moringa School	TVC	Public	Nairobi
938	Nairobi Technical Training Institute	TVC	Public	Nairobi
955	National Integrity Academy	TVC	Public	Nairobi
956	National Youth Service Institute of Business Studies	TVC	Public	Nairobi
1.015	NYS Engineering Institute	TVC	Public	Nairobi
1.018	NYS Textile and Garment Making Technical institute	TVC	Public	Nairobi
1.038	P. C. Kinyanjui Technical Training Institute	TVC	Public	Nairobi
1.073	Railway Training Institute	TVC	Public	Nairobi
1.085	Regional Centre for Mapping of Development Resources	TVC	Public	Nairobi
1.29	The Kabete National Polytechnic	NP	Public	Nairobi