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**THE MOBILE MODEL OF TEACHER PROFESSIONAL
 DEVELOPMENT AND ITS EFFICACY IN ENHANCING CAMEROON
 NURSERY AND PRIMARY SCHOOL TEACHERS' PROFESSIONAL
 DEVELOPMENT**

*A Thesis of PhD Degree of Education defended on 7th
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TITLE PAGE

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EFFICACY IN ENHANCING CAMEROON NURSERY AND PRIMARY SCHOOL
TEACHERS' PROFESSIONAL DEVELOPMENT**

BY

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APPROVAL PAGE

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DECLARATION

I, Kenne Lambou Bellmon hereby declare that this thesis titled **The Mobile Model of Teacher Professional Development and Its Efficacy in Enhancing Cameroon Nursery and Primary School Teachers' Professional Development** is the result of my own work except for quotations and summaries which have been duly acknowledge.

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CERTIFICATION

This is to certify that this thesis titled *The Mobile Model of Teacher Professional Development and Its Efficacy in Enhancing Cameroon Nursery and Primary School Teachers' Professional Development* was carried out by Kenne Lambou Bellmon (Registration Number 14Y3846) in the department of Curriculum and Evaluation of the faculty of Education in the University of Yaounde I, in Partial Fulfilment of the Requirements for the Award of a degree of Doctor of Philosophy (Ph.D) in Curriculum and Evaluation.

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DEDICATION

To

The Kennes

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ABSTRACT

The One-shot model practiced in Teachers' Professional Development in Cameroon has been criticized for being too short, lacking continuity and not meeting the full professional development needs of teachers. Such scenario appears to require the introduction of a different paradigm in the Teacher Professional Development Process in Cameroon nursery and primary schools. Based on this assertion, this study was conducted to: Identify the weaknesses underpinning the one-shot model of teacher professional development in Cameroon nursery and primary schools, map out teachers' preferences in a continuous teacher professional development model based on mobile learning, test the developed model before its rollout amongst teachers and suggest policy orientations that could foster the implementation of the model. The embedded mixed research design was used to conduct the study in two phases. In phase one, 384 teachers randomly selected from the ten regions of Cameroon, took part in a nation-wide survey aimed at identifying the shortcomings of the one-shot model of teachers' professional development, map their preferences in the design consideration of a mobile model to enhance their professional development and gather policy orientations in the integration of technology in the professional development practices in Cameroon. Data collected were analyzed using the Statistical Package for Social Sciences version 26.0. The quantitative data of the nation-wide survey was analyzed using frequency counts while the qualitative data was analyzed using the thematic content analysis. The findings revealed that the one-shot model to enhance Teachers' Professional Development is fragmented and short lived and insufficient to meet the full professional development needs of teachers. From this finding, the participants expressed the desire for a professional development model which is continuous, motivating and collaborative. They proposed that the government should formulate a clear policy guiding the integration of technology in the professional development process of teachers. Emerging themes from these findings were used to develop a mobile model. In phase two of the study, the developed model was tested on a cohort of 50 nursery and primary school teachers randomly selected from the Centre Region. The participants were administered a pre-test, later engaged in a six weeks professional development program conducted using online and face-to-face modes. At the end of the study, they were administered a post-test and the paired t-test was used to correlate the scores of the pretest and post-test. The analysis indicated a p-value of 0.000 indicating that there was a statistically significant difference in mean score between the pre-test and the post-test. On these grounds, this study recommends that the ministry should formulate a clear policy on the introduction of ICTs in the professional development of teachers. Teacher trainers should get themselves versed with the use of technology in education and should enhance cooperation and collaboration amongst teachers during professional development activities.

Keywords: Mobile learning Model, efficacy, primary school teachers, Teachers' Professional Development, ICT in education

RÉSUMÉ

Le modèle pratiqué dans le développement professionnel des enseignants au Cameroun a été critiqué pour sa brièveté, son manque de continuité et le fait qu'il ne répond pas à tous les besoins de développement professionnel des enseignants. Un tel scénario semble nécessiter l'introduction d'un paradigme différent dans le processus de développement professionnel des enseignants dans les écoles maternelles et primaires du Cameroun. Sur la base de cette affirmation, cette étude a été menée pour : Identifier les faiblesses qui sous-tendent le l'utilisation des séminaires pour le développement professionnel des enseignants dans les écoles maternelles et primaires du Cameroun, cartographier les préférences des enseignants dans un modèle de développement professionnel continu des enseignants basé sur l'apprentissage mobile, tester le modèle développé avant son déploiement parmi les enseignants et suggérer des orientations politiques qui pourraient favoriser la mise en œuvre du modèle. La méthode de recherche mixte a été utilisée pour mener l'étude en deux phases. Dans la première phase, 384 enseignants sélectionnés au hasard dans les dix régions du Cameroun ont participé à une enquête nationale visant à identifier les lacunes des séminaires dans le développement professionnel des enseignants, à faire ressortir leurs préférences en matière de conception d'un modèle mobile pour améliorer leur développement professionnel et à recueillir des orientations politiques sur l'intégration de la technologie dans les pratiques de développement professionnel au Cameroun. Les données recueillies ont été analysées à l'aide du logiciel *Statistical Package for Social Sciences* version 26.0. Les données quantitatives de l'enquête nationale ont été analysées à l'aide de comptages de fréquence, tandis que les données qualitatives ont été analysées à l'aide de l'analyse de contenu thématique. Les résultats ont révélé que le modèle l'utilisation des séminaires dans le développement professionnel des enseignants est fragmenté, de courte durée et insuffisant pour répondre à l'ensemble des besoins des enseignants en matière de développement professionnel. À partir de ce constat, les participants ont exprimé le souhait d'un modèle de développement professionnel continu, motivant et collaboratif. Ils ont proposé que le gouvernement formule une politique claire guidant l'intégration de la technologie dans le processus de développement professionnel des enseignants. Les thèmes émergents de ces résultats ont été utilisés pour développer un modèle mobile. Dans la deuxième phase de l'étude, le modèle développé a été testé sur une cohorte de 50 enseignants de maternelle et de primaire sélectionnés au hasard dans la région du Centre. Les participants ont été soumis à un pré-test, puis se sont engagés dans un program de développement professionnel de six semaines mené en ligne et en face-à-face. À la fin de l'étude, ils ont été soumis à un post-test et le t- test a été utilisé pour établir une corrélation entre les resultats des 2 tests (pré-test et du post-test). L'analyse a révélé une valeur p de 0,000 indiquant qu'il y avait une différence statistiquement significative dans le score moyen entre le pré-test et le post-test. Pour ces raisons, cette étude recommande au ministère de formuler une politique claire sur l'introduction des TIC dans le développement professionnel des enseignants. Les formateurs d'enseignants devraient se familiariser avec l'utilisation de la technologie dans l'éducation et renforcer la coopération et la collaboration entre les enseignants au cours des activités de développement professionnel.

Mots-clés : Modèle d'apprentissage mobile, efficacité, enseignants du primaire, développement professionnel des enseignants, TIC dans l'éducation.

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ABBREVIATION

ICT: Information and Communication Technologies

IGE: Inspector General of Education

IMT: Interactive Mobile Technology

MINEDUB: Ministry of Basic Education

MKO: More Knowledgeable Other

OECD: Organization for Economic Cooperation and Development

PD: Professional Developmet

PEU: Perceived Ease of Use

PU: Perceived Usefulne

TPD: Teacher Professional Development

UNESCO: United Nations Educational, Scientific and Cultural Organization

CHAPTER ONE

INTRODUCTION

Ensuring the quality of Teacher professional Development (TPD) is a great way of ensuring the quality of education that goes on in the classrooms (McAleavy, Hall, Horrocks & Rigall, 2018). Therefore where the quality of teacher professional development is found wanting, there is a high probability that the quality of teaching that goes on in classrooms will also be found lagging in some aspects. In cognizance to this, different nations and educational systems have chosen different models of leveraging Teacher Professional Development packages to their teachers. The model chosen is based on perceived effectiveness of the model in attaining the TPD objectives. Besides, policy, finance and know-how are also factors that determine the type of TPD model to be chosen by a given educational system.

Cameroon in a bid to improve the quality of education in its nursery and primary schools, adopted the one shot model of Teacher Professional Development (Nkweni, 2014). This model has been criticized for the fact that it lacks continuity, planning, budgeting and it's a kind of one size fit all (Summey, 2013). Thus, these weaknesses make the model not strong enough in meeting the PD needs of the teachers. Introducing a more effective model might have significant benefits in improving the quality of education in Cameroon nursery and primary schools. However, prior to the introduction of a new model, there is a need for this study to investigate the workability and intricacies of the new model to be introduced in TPD in Cameroon nursery and primary schools.

Background of the Study

A sweeping wind is blowing through the education sector worldwide, where the new tendencies to enhance teacher professional development is done through the use of mobile learning (Schuck, Kurden & Aubusson, 2009) these researchers further postulate that research in the past has been based on the integration of Information and Communication Technologies in the school curricula and its potential in enhancing students' learning, but the recent development is now focused on how teachers can use ICTs in enhancing their own professional development. Though this is still a growing concern with some challenges like the disconnectedness of some teachers from the global network and unpredicted time schedule, the use of technologies in facilitating teachers

professional development is of great consequence as it optimizes the chances of a teacher to gain access to current education information, helps them to collaborate on different learning platforms in order to reflect on and analyze their professional practice with the aim of improving on the quality of the delivery of their professional services. The improvement in the quality of services teachers deliver invariably influences the quality of education which learners receive, a phenomenon which is in congruence with the global concern of the Millenium Development Goals and the fourth Sustainable Development Goal. The Millennium Development Goals 2000-2015 calls for the achievement of universal access to basic education, though this has been achieved to some extent, it has been realized that the children who are already in school are learning very little partly because the professional development of basic education teachers is perceived to be insufficient (McAleavy, Hall, Horrocks & Rigall, 2018). These authors insist that strategies to arrest this repugnant situation, must be sought to ensure the adequacy teachers' professional development, especially in the third world countries. In order to continue the struggle of achieving quality education, in 2015, the United Nations launched the 2030 strategic vision for sustainable development, which took the form of the Sustainable Development Goals (SDGs), (United Nations, 2018). Cameroon is a signatory to this vision whose goal 4 calls for an improvement in the quality of education. The call for quality education by the UN is further compounded by the effort of Cameroon to attain emergence by 2035. The Cameroon vision 2035 in section II.2 expresses the desire of having “well trained youth exalting merits and country’s expertise”. Having well trained youth, who are experts in their fields, can only be achieved through quality training with the availability of quality teachers. Target 4c of the 4th SDG advocates thus:

By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States (UN, 2015).

From this, it can be ascertained that the continuous professional development of teachers is a great strategy towards the universal effort of achieving quality education, though more emphasis should be placed on the developing countries like Cameroon. Several strategies are available to provide in professional development to teachers, the most common being face to face seminars, workshops, peer to peer exchanges, the use of technology, just to name a few. However, it has

been intimated that face-to-face seminars and workshops which are commonly used to enhance teacher professional development still has more to be desired, especially as Mobile learning has been spearheading the academic world in recent years (Crescente & Lee, 2011; Guskey, 2002). Besides the growing strength of mobile learning concerns in the world, the quality of teachers in our schools has kept the global education community worried, as they seek strategies to consistently improve the professional development of teachers (Unwin, 2015), such is due to persistent inadequacies of workshops and seminars to achieve this goal. These seminars and workshops involve bringing teachers to an agreed location, accommodated and given teaching-learning materials to accomplish a specified task under the tutorship of external experts and facilitators (Mwaruma, 2013). The researcher further intimates that these one-shot seminars and workshops which most often last from a day to a week have been ineffective in ensuring the continuous development of teachers because it lacks follow up and mentoring mechanisms. It has also been identified that one of the reasons for the inadequacy of seminars and workshops to enhance teachers' professional development stems from the fact that teachers themselves are not consulted on how the program should work (Summey, 2013). Thus, some of them attend these seminars and workshops as a means of avoiding administrative sanctions or just to please their administrative hierarchies. The researcher further posits that to ensure an effective teacher continuous development program to meet the needs of the teachers concerned, needs assessments must be carried out. This is due to the fact that Needs assessment help to identify areas of teaching difficulties of various teachers, feedback from prior trainings and align training activities to the recommended program. He further makes mention of the fact that needs assessment is not usually done before the usual seminars and workshops because the organizers most often use it as a sporadic means to add some money to their bank accounts. Such situation is not a good sign for a bright future of the pupils who are expected to live in a global economy characterized by smart thinking, the use of technology, competition and the employment of skills (Unwin; 2015).

In support of this view point, a researcher while buttressing the views of other practitioners observed that despite the advent of educational technology, teaching and learning in most developing countries has remained as they were in 20th century (Nkwenti, 2014). The researcher goes further to postulate that the situation is not different in Cameroon where learners' learning is typically based on rote memorization of facts with teachers occupying the centre stage of the teaching learning transaction, a situation which stands sharply in contra to the pedagogic triangle.

Looking at this situation that has characterized the professional development of teachers who determine the future of tomorrow's leaders, there is an urgent need for the situation to be rescued through a modification of the medium and manner in which teachers' professional development can be assured. Various countries have been taking great strides in ensuring the proper professional development of teachers as a means of increasing the supply of quality teachers who will go a long way to improve the quality of education being received by their citizens. There is however the hope that integrating technology in this course will relieve the states of this burning desire. Besides, it is worth noting that even though the need to use a modern and most updated model of TPD is the desire of every economy, the concept has evolved over time.

Brief Evolution of Teacher Professional Development Practices Studies have shown that many teachers are not ready to deal with the new challenges because they were raised and educated in a *conventional way* (Friesen & Clifford, 2003), which according to Haberman (1991; 1992, p. 16) can be termed as the *Pedagogy of Poverty*. For the first half of the 20th century, teaching in a classroom was a matter of teachers carrying out recitation, lecturing, note taking, asking questions and expecting answers from pupils. Hargreaves and Fullan (2000) described this period as the *Pre-professional Age*. According to the researchers, a professional teacher should be able to master the subject matter, get it across to learners, and control the students. Becoming a teacher was an apprenticeship, involving the process of trial and error. Only in the 1960s that learners started to be considered as significant subjects in the teaching process (Hargreaves & Fullan, 2000). In this age of the autonomous professionalism, teachers had more autonomy in choosing their pedagogical methods. To the researchers, teachers during this period still held their main roles as the main information providers within the classroom setting. Hargreaves' definition regarding the Pre-professional Age has been taken from the global point of view, however, in reality, there are still many teachers and policy makers in the Cameroonian education institutions, who still practiced this pre-professional practice.

The next period was called the *Age of the Autonomous Professional*, this period spanned from 1960 onward. This period saw an improvement in teachers' status and standing as the period gave classroom teachers more autonomy, and the autonomy to be able to use teaching principles that they thought best and more suitable for their learners. However, the principal challenge of this period was excess individualism (Hargreaves 2003). Individualism in teaching without any

intervention from other colleagues animated the practice of teaching during this era. Some form of collaboration could be traced during this period but it just occurred in small ways and with a limited number of colleagues (Hargreaves, 2000).

Around the mid to late 1980s, Hargreaves (2000) purports that there was a rapid growth of awareness for collaboration among teachers as a means for professional development processes. The researcher calls this age as the *Age of the Collegial Professional*. During this era, learners were no longer considered as an object in the teaching and learning transaction, for there was a societal change which advocated for the inclusion of pupils in the decision making process. Policy makers in different states advocated for a new collaborative structures among teacher colleagues in schools as a strategy of improving teachers' professionalism in schools world over. In the course of this era, a series of studies were conducted to lay a solid knowledge base on the effectiveness of the TPD process in changing teachers' behaviour and influencing student outcomes (Guskey, 1986; Joyce & Showers, 1982). However, Scott (2010) indicates in a study that there was a significant gap between the theory of effective TPD and the circumstances that surrounds the practice within educational sphere.

(Hargreaves, 2000) identifies a fourth period in the evolution of teacher professional Development. Hargreaves calls it the *Age of Post-professional*, which according to him began at the beginning of the 21st century. To the researcher, this period is characterized by globalization of economies and a rapid development of educational technology. This great change in the world has caused a large amount of uncertainty among teachers as well as policy makers, concerning what actually knowledge is, and what kind of knowledge is valuable to pass on from one generation to the next. Hargreaves (2000) stipulates that this fourth period is a crossroad for teachers' professionalism and the way professional development for teachers should be hence perceived and interpreted. The researcher notes that the transition from one period to another varies from one country to another - from one school system to another. Based on Hargreaves' sequential periodic division, it can be noted that the world is presently in the fourth period. Despite constant evolution it has been noticed that many teachers' mindsets can be situated to previous periods of TPD. In Cameroon, many teachers still believe strongly hold on to the teacher-centred philosophies of teaching and learning (*pre-professional age*), whereas some have started migrating to the *age of the collegial professional*. Despite the various stages that the TPD

practice has traversed, the practice is still not stagnant as it is continuously undergoing reformation.

Ongoing Teacher Professional Development Reformation

Despite its stage, each TPD practice is aimed at bringing a change in classroom practices. TPD is a systematic effort to change, improve and amend teachers' attitudes, beliefs and subsequently the learning outcomes of the students (Guskey, 2002). The epistemological beliefs of different teachers influences the way they construct knowledge and develop their understanding of learning, knowledge and teaching. To some teachers, undergoing TPD through one-shot workshops or conferences is not strong enough to bring about a change in classroom practices, whereas others think that the role of peers or colleagues as well as technologies are of great significance to help them improve on their practices as teachers. Irrespective of the individual epistemological beliefs, TPD programs should be an ongoing or continuous process of reflective learning (Darling-Hammond, 1994). The researcher further opines continuity is an essential element of TPD that needs to be present in order to initiate an improvement in the practice of teaching. The present practice of TPD in many countries, especially in Sub Saharan Africa is often carried out as a short-term isolated event, such as one-shot workshop or conference, lecture with guest speakers, and staff meetings focused on policy implementation or pragmatic matters of school procedures (Scott, 2010). This model of TPD usually applies a top-down approach with gives limited opportunities for classroom teachers' contribution, collaboration and reflection in issues related to the execution of their duties. Literature holds that the traditional forms of TPD are no longer effective in bringing about an improvement in teachers' practice of teaching in the conventional classroom (Darling-Hammond, 1998; Joyce & Showers, 1980, 1982; Lieberman & Pointer-Mace, 2008).

A glaring reformation on the practice of TPD is thus necessary to address the challenges of the 21st century educational practices. A series of recent studies have been undertaken to examine how to conduct TPD in a more effective manner to ensure continual support for classroom teachers in 21st century, so that they can improve on their professional competencies and fulfill all the critical demands of educating learners in this era of globalisation (Barab et al., 2001; Duncan-Howell, 2007; Helleve, 2010; Lloyd & Duncan-Howell, 2010; Scott, 2010). Persistent reflection is one of the most crucial issues of TPD to help teachers improve their professional

competencies. To Helleve (2010), TPD is a continuous ongoing reflective activity conducted in a learning community with the aim of bringing about a significant improvement in the practice of teaching in classrooms. Rather than viewing TPD as an exclusive activity carried out in isolation, Helleve (2010) suggests that to conduct an effective TPD, collaboration must be the watch word in the teachers' learning community. Teacher trainers from teacher education institutions and experienced teachers from schools are to be involved in this continuous reflective activity through action research, where pupil teachers and novice teachers are included in order to benefit from the collaborative learning interaction. In Asia-Pacific context, the continuous role of mentor teacher/cooperating teacher/supervising teacher is crucial and highly upheld as a strategy of improving the professional experience of the pre-service teachers (Northcote & Lim, 2009). Social learning interactions through collegial collaboration in TPD encourages different ways of thinking and empowers classroom teachers. Peer Coaching Study Teams (PCST), a model of TPD initiated by Showers and Joyce (1996), lays emphasis on the importance of sustained, in-context, student-focused and collegial support. Saris (2012) purports that instead of going for a TPD workshop or seminar, teachers could only need to contact and visit their peers' classroom and observe the way they implement their teaching strategies and interact with learners, while reflecting on their own practice during lessons. They might decide to share teaching materials/resources and have the ability to collaboratively develop various lesson plans. This model has significantly reduced teachers' isolation, fostered newer and better ways of thinking about teaching practice and reduced teachers' workload through joint planning and resources development. Collegial collaboration within a school team is a great practice for a school learning community to improve the quality of teaching and learning on a continuum. DuFour and Eaker (2004) were the first to introduce the Professional Learning Community (PLC) as a community-oriented model to promote mutual cooperation, emotional support, personal growth and synergy effort between teachers as a means of learning professional practices from one another and thereby improving on their professional development. This approach incorporates the entire teacher community to improve teaching and students' learning outcomes together. This can be done by examining their teaching practice, assessment and student achievement data (Sari, 2012). The researcher holds that this ongoing activity can be conducted within the normal school workdays throughout the entire school year in order to ensure that all teachers can participate in the TPD program. Other Communities within and outside the school have a significant role in

influencing the professional development of teachers. (Sari, 2012), thinks that delving into the teaching profession in the 21st century can be likened to process of undertaking a journey.

Lloyd and Duncan-Howell (2010) are of the opinion that the social and technological changes of the 21st century are reflected in contemporary schooling. Teachers in this society are expected to cope with these changes and master the subjects of teaching as well as the very challenging learning environment. As a result, the researchers suggest that online learning community (OLC) is a “flexible, authentic, reflexive and personalized model of TPD to support, guide and inspire teachers”. In an OLC, teachers who constitute the community members are immersed directly within the context of teaching and learning geared towards achieving professional development. Lloyd et. al. (2005) and Duncan-Howell (2007) use the image of a *journey* to illustrate the learning path that teachers need to undertake in order to reach their desired professional destination, where collaboration amongst teachers can be regarded as the driving force. Such a transformation can also be applicable in the Cameroonian context.

An Overview of Cameroon

Before getting into the intricacies of TPD in Cameroon, it is essential to have an over view of Cameroon alongside its pedagogic supervisory chain. The supervisory chain is charged with ensuring the quality of teaching that goes on in Classrooms as well in up skilling teachers to meet up with the exigencies of the educational system.

Cameroon is a Central African state which derived its name from *Rio Dos Cameroes*, a Portuguese expression for “River of prawns.” The country gained independence from her French and British colonial masters in 1960 and 1961 respectively. The country is made up of about 250 ethnic groups and national languages reflecting its ancestral heritage. It is presently a bilingual Country, having English and French as its official languages. Made up of 10 regions, the country’s English-speaking population is mostly concentrated at the North West and South West Regions of the Country, while the French Speaking population occupies the other eight regions.

Economically, Cameroon is a middle-income country with a population of about 25.31 million as of 2019, with about 62 percent of the population aged between 0-25 years (World Population Review, 2019). This figure places the country at the 54th position of the most populous countries in the world and the 17th most populous country in Africa. The gross domestic product of Cameroon has stood at 5.5 and 5.9 percent between 2013 and 2015, with a GDP per capita of

1.429 USD as of 2014 (World Bank, 2017). According to this World Bank report, the country's growth rate has been too slow over the last decade to lead the country to sustainable development, significant poverty reduction and shared prosperity. The report moves further to posit that about 40 percent of the population lives below the poverty line and one quarter of the country's population is actually living in what it terms *chronic poverty*, despite its rich endowment in natural resources like oil, high value timber and agricultural resources. It equally has a highly educated work force when compared to its neighbours like Central African Republic and Equatorial Guinea.

Geographically, Cameroon is located at the Gulf of Guinea at the centre of Central and West Africa, it is the 24th largest country in the world with a surface area of 475.442km² (183,521 square miles), representing a little more than 1 percent of the African continent (World Population Review, 2019). The country is sparsely populated with about 40 people per square kilometer (103 per square mile), placing it at 167th position in the world for population density. Cameroon is bounded in the south by the republic of Equatorial Guinea, Congo and Gabon, in West by the Federal Republic of Nigeria, in the East by Republic of Central Africa and Chad and to the North by part of Lake Chad.

In the central African region, Cameroon is often a safe harbor for refugees and asylum seekers. In 2007 about 97000 refugees flew into Cameroon principally from the Central African Republic, Chad and Nigeria, running from war orchestrated in their various countries. Such a situation continued in 2001 with about 90.000 refugees fleeing into Cameroon from the Central African Republic at a rate of about 2000 refugees per week. With this influx of refugee situation, Cameroon's limited resources make her dependent on the United Nations for support to carter for the 320.000 refugees and asylum seekers resident in the country by September 2017 (CIA, 2018,; UNCR, 2014)

The Structure of Basic Education Cameroon

Cameroon is a bilingual country with English and French as the official languages. Due to the bilingual nature of the country, Cameroon's educational system is bilingual in nature with the Anglophone and Francophone sub-systems co-existing in a multicultural setting. Both sub-systems of education are structured into basic, vocational training, secondary and higher education (Education and Training Sector Strategy (2013).

Basic education in Cameroon is an umbrella term for Nursery education and primary education. Kids are admitted into nursery school from the age of 4 years, where they stay in school for 2 years (Nurseries 1 and 2) after which they are allowed to move into primary education at the age of 6 after fulfilling promotion requirements.

Primary education on the other hand for both the Anglophone and Francophone sub-systems last for a duration of six years and is divided into three levels, with two classes at each level. Level one comprising classes 1 and 2 (SIL and Course Préparatoire (CP) for the Francophone subsystem), Level two, consisting of classes 3 and 4 (Course Élémentaire (CE) 1 et Course élémentaire (CE) 2 for the francophones sub-system) and Level three containing classes 5 and 6 (Course Moyen (CM) 1 et Course Moyen (CM) 2 for the francophones sub-system). At the end of the primary school cycle, pupils of class 6 or French speaking pupils of CM2 seat in for the Government Common Entrance (Entrée en 6^{me}) and the First School Leaving Certificate (CEPE) successful pupils in these exams are allowed to move into secondary school.

At the end of Basic education, some learners who would have loved to progress into secondary school fail to do so probably because their parents cannot afford secondary education (Nkwenti, 2014). He further posits that some of these children are left with no other option than to drop out and learn various forms of trades, while others just stay home hoping to raise money and continue their education or learn a trade. Some of the basic education drop outs migrate to urban centers hoping to find something better for themselves, yet some go to the home of their relatives and other employers and serve as house helps, servants and baby sitters. As a compensation to the services they offer, they are enrolled in various non-formal education centers to learn a trade or are later on enrolled in an “evening school” where they are prepared to sit in for the Ordinary Level Certificate exams for three years instead of following the normal five year program.

Basic Education Pedagogic Supervisory System in Cameroon

The supervision of instruction is universally acclaimed as an important component of a comprehensive strategy of enhancing teachers’ professional development (MINEDUC, 1996). The principal objective of instructional supervision is to provide support to teachers so that in turn they can provide more enabling learning environment for learners and even performing their teaching task with a much higher level of professionalism which acts as a catalyst in the provision of quality education to learners. A key theme running through both the 1995 National

Education Forum in Cameroon and the Draft Document of the Sector-Wide Approach to education is the need to strengthen teacher quality as part of comprehensive strategy towards efforts aimed at improving the quality of educational services (Titanji & Youh, 2010). Chapter III section 2;1 of the orientation law in Cameroon holds that teachers are the guarantors of quality education (Republic of Cameroon, 1998) . For these teachers to stand up to their task as the guarantors of quality education, they need a support system through which their professional development can be guaranteed. They need supervisors who can constantly inform them of updates in the practice of teaching as well as to up supervised skill them in the discharge of their teaching function. In an overview of the literature on the supervision of instruction, and staff professional development, Wanzare and da Costa (2000) identified nine inter-related principal aims of instructional supervision. These include:

- Improving the quality of instruction in schools (Beach & Reinhartz 1989; Glickman et al. 1998; Sergiovanni & Starrat 2000).
- Enhancing the professional development of teachers on individual and group bases (Wiles & Bondi 1996).
- Creating a serious awareness among practicing teachers on the potential consequences of their behaviour during teaching will have on their learners and on the learning process as a whole (Glickman et al. 1998).
- Creating a suitable teaching/learning environment within which teachers, as groups and individuals, can experiment with new approaches to instruction (Nolan & Francis 1992).
- Promoting curriculum development (Glickman et al. 1998).
- Creating and improving collegiality norms among teachers and school supervisors (Glickman et al. 1998; Wiles & Bondi 1996).
- Improving the commitment and motivation of teachers (Glickman et al. 1998).
- Making and nurturing norms of collective inquiry among school supervisors and teachers (Glickman et al. 1998; Nolan & Francis 1992).

Sergiovanni (1992: 2004) clearly explains the motives of instructional supervision in the following words:

“We supervise for good reasons. We want schools to be better, teachers to grow, and students to have academically and developmentally sound learning experiences; and we believe that

supervision serves these and other worthy ends. But all the benefits that we seek can be obtained more easily and in enhanced ways in the natural course of events as teachers and students live and learn together in schools. Supervision, in other words, can just as easily come from the inside as the outside”.

It is for this reason that Basic education in Cameroon is at different levels (organizational chart of the Ministry of Basic Education, 2012). The aforementioned organizational chart holds that at the central Level, the Inspector General (IGE) is assisted by five Inspectors of Pedagogy amongst others is charged with: Conceiving innovations in areas of pedagogic approaches, evaluation methods, teaching methods, pedagogic supervision and inspection gather findings from scientific research, research centers and universities and taking them into consideration, request for studies on issues related to pedagogy, andragogy and adaptation to technological and scientific developments.

Educational supervisors at the central level promote pedagogic evolution; ensure overall implementation of innovations carried out, system coherence and unity of action throughout the educational system. Educational supervisors at the central level keep the files of other personnel in the supervision chain. It is also charged with keeping a national database of the rate of coverage of the national syllabus, and various problems identified in the various regions of Cameroon. It also treats matters related to the qualification of all pedagogic supervision personnel, implementation of the chosen pedagogic methods, techniques and processes of education, and the specific problems of each region. The IGE compiles the database from field surveys and reports from all the Regions of the country.

The next level of pedagogic supervision in the ministry of Basic education is the Inspectorates of Pedagogy which each is placed under an inspector of pedagogy amongst other duties, they are charged with: conceiving and developing curricula; permanently monitoring, controlling and evaluating learning methods, teaching programs, teachers, textbooks and didactic material; initiating pedagogic enquiries in Regional Delegations; organising and monitoring continuous teacher training; developing teaching aids; just to name a few.

The next level of pedagogic supervision within the ministry of Basic education are the National Inspectors who amongst other tasks are charged with executing the following functions: prepare an annual action plan (including a detailed budget) which is consistent with the orientations of his

his/her Inspectorate; plan his/her pedagogic supervision activities in the Regions by using a Gantt chart or other planning tool) in line with those of his colleagues; analyse field reports, data-collection tools from field trips, and suggest remedial solutions to previously observed problems among pedagogic supervisors of lower ranks, and teachers; regularly visit regions to assess the level of implementation of recommendations made during continuous training sessions, school visits, Functional Literacy Centres (FLC), Non-formal Basic Education Centres (NFBEC), and systematic inspection visits.

At the decentralized level the following structures and personalities are in charge of pedagogic supervision according to the organizational chart of MINEDUB;

Inspectorate for the Coordination of Education

Placed under the authority of an Inspector Coordinator of Education who is the immediate collaborator of the Regional Delegate of **Basic Education**, the Inspectorate for the Coordination of Education amongst others is in charge of: coordinating all pedagogic activities in the Region as regards nursery and primary education, promotion of bilingualism, literacy, basic, non-formal education, and promotion of national languages and educational technologies; implementing, in close collaboration with the Inspector General of Education, major pedagogic orientations and school curricula for nursery and primary education, as well as training programs for teachers and other support staff.

Regional Pedagogic Inspectorates

Each placed under the authority of a Regional Pedagogic Inspector. Regional Pedagogic Inspectorates amongst other duties are in charge of the following in their respective areas: implementation of curricula; monitoring, control and continuous assessment of learning in specific areas; pedagogic field work in Divisional Delegations; organisation and monitoring of training of teachers and department heads in the Region and in specific domains; monitoring the use of teaching aids ; preparation of the annual evaluation report of educational activities on a given domain at the regional level.

Regional Pedagogic Advisers

Irrespective of their specialty or Inspectorate of origin, the Regional Pedagogic Advisers according to the organizational chart of MINEDUB shall fulfill multifaceted functions, and work in collaboration with RPC of the other Regional Inspectorates of Pedagogy. They shall work closely with RPIs because they constitute their immediate collaborators. They shall propose improvements in the area of pedagogy to boost teaching and learning in the Region, in conformity with directives of the central level.

In view of carrying out its mission, each RPC shall: prepare an annual action plan which is consistent with the orientations of his/her Inspectorate of Pedagogy; plan his/her pedagogic support activities in the Divisions using a Gantt chart or other planning tool, in line with those of his/her colleagues; analyse field reports, data collection tools from field visits, and propose remedial solutions to previously observed problems among pedagogic supervisors at lower levels, and among teachers amongst others.

The next level of pedagogic supervision at the decentralized stage in MINEDUB is the divisional level. The Divisional Level is made up of the Divisional Delegation and Sub-Divisional Inspectorates. It is structured as follows:

The Divisional Delegation of Basic Education

Placed under the authority of a Divisional Delegate, the Divisional Delegation of Basic Education is amongst other duties in charge of the following pedagogic missions: identifying the main NGOs of the Division (working in the field of literacy education) that may be involved in program activities; promoting collaboration with the main literacy education partners/stakeholders; providing support for all activities related to awareness raising and social mobilisation; coordinating all pedagogic activities in the Division as regards nursery, primary, literacy, non-formal basic education, and promotion of national languages just to name a few. To accomplish this mission, he/she is assisted by 05 Divisional Pedagogic Advisers.

Divisional Pedagogic Advisers

Irrespective of their specialty, Divisional Pedagogic Advisers shall try as much as possible to fulfil multi-faceted functions, and work in collaboration with other Divisional Pedagogic Advisers. They shall work closely with RPIs because they constitute their immediate pedagogic

collaborators at the Divisional level. They suggest improvements in the field of education to boost teaching and learning in the Department.

In order to carry out their missions, each DPC is required to: prepare an annual action plan which is consistent with the orientations of the Divisional Delegate; plan his/her pedagogic support activities in the sub-divisions using a Gantt chart planning tool in line with those of his colleagues; analyse field reports, data collection tools from field visits, and propose remedial solutions to previously observed problems among pedagogic supervisors at lower levels, and among teachers; regularly visit sub-divisions in accordance with the laid-down action plan.

Another stage of pedagogic supervision of instruction in MINEDUB is the sub-divisional level. The Sub-Division constitutes the operational and pedagogic implementation level per se. This consists in operationalising and implementing pedagogic practices with regard to pedagogic innovations in schools, pedagogic approaches, and assessment methods, methodologies of literacy and non-formal basic education, and promotion of national languages.

This level ensures system consistency, unity of action in all schools cluster, pedagogic zones, nursery and primary schools, literacy and non-formal basic education centres. To this end, it establishes a data base of information on personnel, program coverage levels, problems in schools, FLC, NFBEC, and issues concerning the qualification of Head teachers and teachers. It also ensures implementation and understanding of pedagogic approaches, teaching/learning methods, teaching techniques and processes, and problems specific to each structure. The database is compiled from field surveys and reports from schools, FLC, and NFBEC. This level is structured as follows:

The Sub-Divisional Inspectorate

Placed under the authority of an Inspector, Sub-Divisional Inspectorate amongst other duties is in charge of the following pedagogic missions: coordination of all pedagogic activities in the Sub-Division as regards nursery and primary education, Literacy and Non Formal Basic Education, and promotion of national languages; administrative and pedagogic inspection of schools, school clusters, community preschool, functional literacy, and non-formal basic education centres and material organisation of official examinations within its jurisdiction. To fulfill these missions, the he Sub-Divisional Inspector is assisted by two Heads of Department.

Heads of Department

Heads of Department are responsible for cohesion of pedagogic action in the sub-division. To this end, they must try as much as possible to fulfil multi-faceted duties. They work closely with the DPCs since they serve as their pedagogic correspondents in sub-divisions. They offer all effective approaches to improve teaching and learning in the sub-division.

In order to carry out their missions, each Head of Department amongst other duties are required to: prepare an annual action plan which is consistent with the orientations of the Sub-Divisional Delegate; plan his/her pedagogic support activities in pedagogic zones, schools, Literacy and Non-Formal Basic Education Centres using a Gantt chart or other planning tool.

The Level of Nursery and Primary Schools

The nursery school or primary public is placed under the authority of a head teacher. Each nursery or primary school head teacher is in charge of: coordinating all pedagogic activities in the school; administrative and pedagogic inspection of his/her assistants; material organisation of group and model lessons; organisation and monitoring of extra-curricular activities in the school; permanent pedagogic supervision, counseling, animation and control of his/her assistants; evaluation of staff under his/her authority; pedagogic evaluation of each level as a unit of pedagogic supervision in the school.

The Level of School Clusters

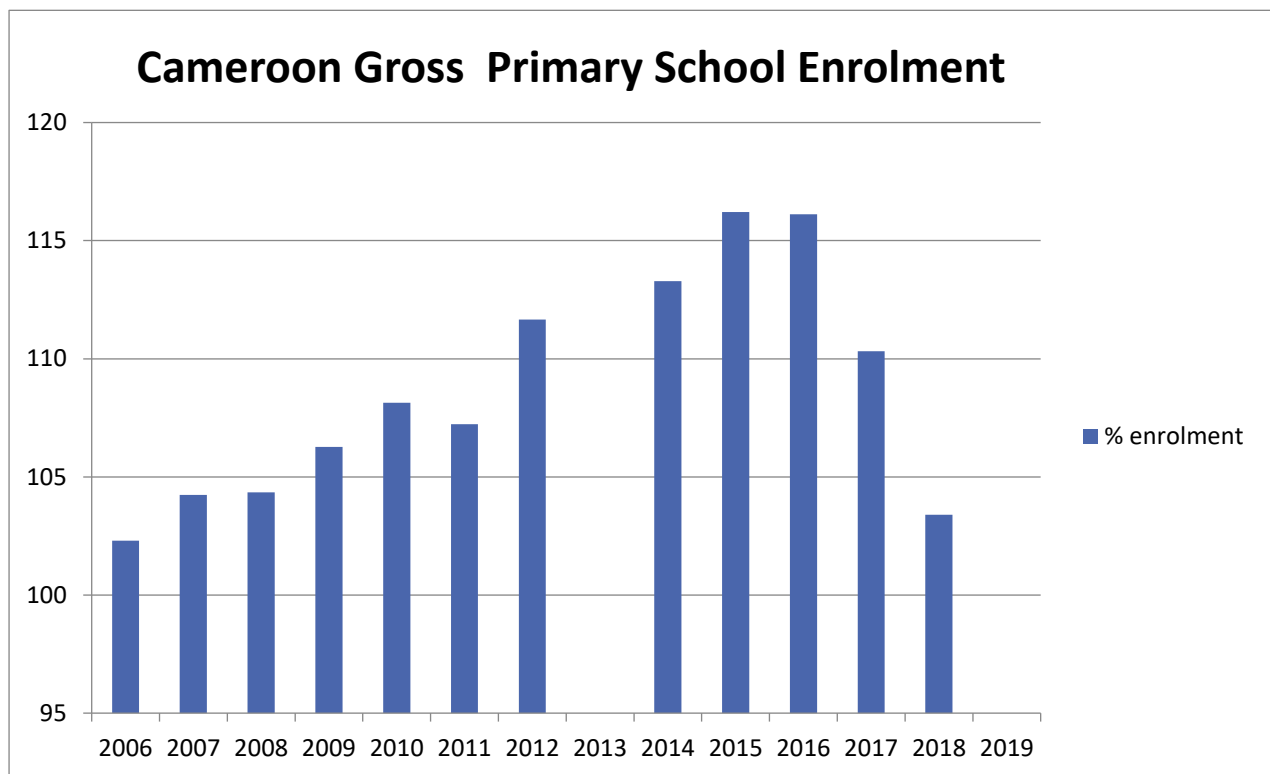
A cluster is made up of a number of schools for purposes of administrative and pedagogic management. Each of the schools belonging to a cluster is called a satellite school. One of the schools plays the role of resource or reference school.

A cluster is headed by a Contact Person (who may be appointed by the SDIBE). The contact person of a cluster: coordinates all shared Cluster pedagogic activities; plans pedagogic activities in the cluster; ensures implementation of workshops or meetings wherein good practices and success stories are validated.

Enrolment in Cameroon Primary Education sub-sector

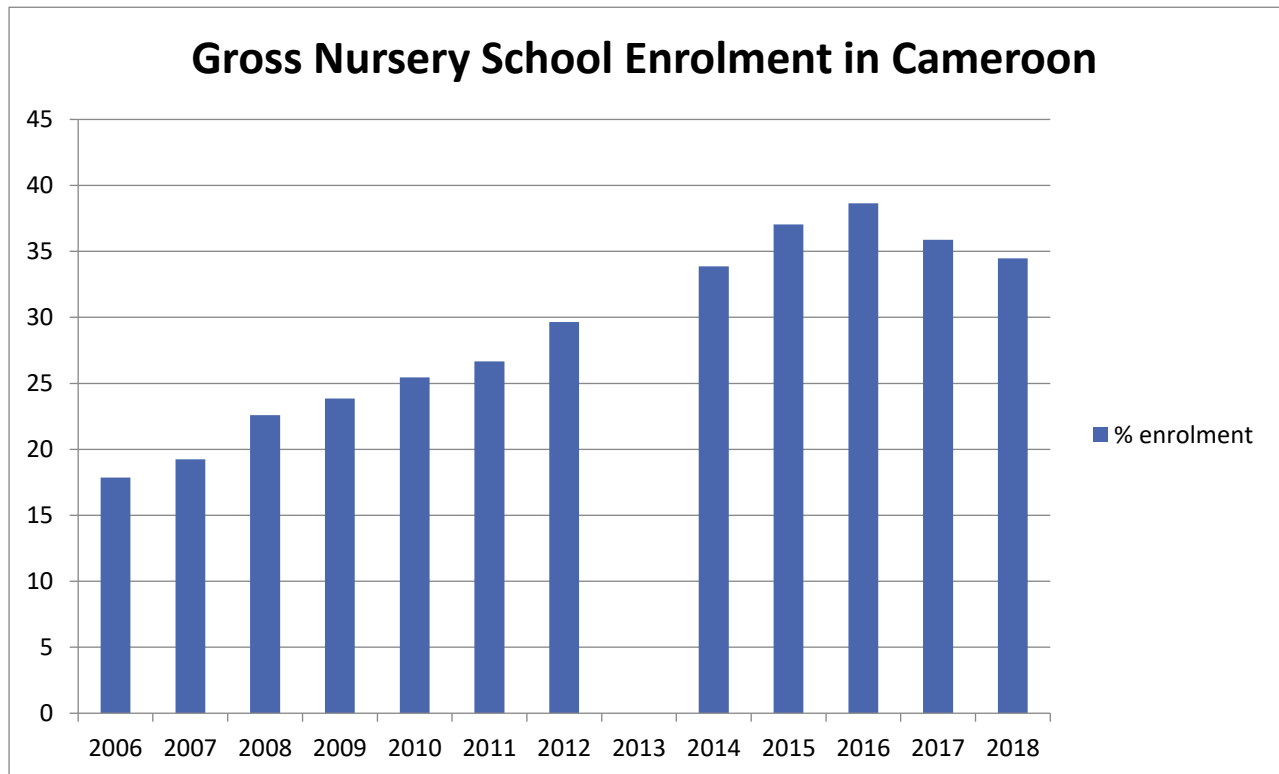
The enrolments of pupils in Cameroon primary schools have been experiencing a steady increase in school demography. However, between 2018 and 2019, the country's primary school population has experienced a decline as seen on figure 1.

Figure 1: Net Primary school Enrollment in Cameroon from 2008-2017 extracted from World Development Indicators (2020)



From figure 1 it can be seen that the Cameroon Basic Education sub-sector has been facing some challenges in recent years as far as primary school enrolment is concerned. Gross enrolment in Cameroon primary schools increased from 103% in 2006 to 117%, in 2015 and 2016. However, the enrolment fell to 110% in 2017 and dropped further to 104% in 2018.

Figure 2: Gross Primary school Enrolment in Cameroon extracted from World Development Indicators (2020)



From figure 2 it can be seen that nursery school enrolment has been increasing steadily between 2006 and 2016. However, nursery school enrollment in Cameroon has been falling steadily in 2017 and 2018. In 2015 the gross nursery school enrolment stood at about 18%, in 2007 it was at about 19%, in 2008 nursery school enrolment was about 23%, in 2009 it stood at about 24% and in 2010 it was at 25%. World Development Indicators (2020) further holds that in 2011, the gross nursery school enrolment was about 27%, in 2012 it was 29.9%, in 2014 the enrolment rose to about 34%, there was a further increase in enrolment in 2015 which stood at 37% in 2016, it reached its apex in recent years with an enrolment of about 38%. It started falling in 2017 when the enrolment dropped from 38% in 2016 to 36%. In 2018 the gross enrolment for Cameroon nursery school fell from 26% in 2017 to 34%.

In 2016-2017 school year, there was a total of 4 371 381 primary education pupils enrolled in Cameroon primary school, 526 947 kids enrolled in nursery school, making a total of 4 898 328 learners enrolled in basic education in Cameroon with 123 532 teachers (Ministry of Basic

Education statistical year book, 2017). The principal problem that has plagued Cameroon's Basic education sub sector over the year are issues related to poor quality teachers, shortage of teachers and teaching materials, security situations, lack of access, insufficient funding and inadequate management of the education sector (UNICEF, 2020). UNICEF (2020) further purports that the priority issues in Cameroon Basic Education is to improve the quality of Basic Education services and sensitize families on the importance of Basic Education.

Quality of Education in Cameroon

According to the Cameroon Education Sector Review Report (2006), the quality of the educational system has been challenged by high repetition rate. It is in response to the high repetition rate of up to 40% that Ministerial order Number 315/B1/1464/MINEDUB of February 21st 2006 introduced the policy of collective promotion within levels (classes one, three and five) (Mambeh, 2018). The researcher further posits that the current repetition rate in Cameroon primary schools stands at 11.7%, a figure which is higher than the repetition rate of other countries with one digit near zero repetition rates, even with the implementation of the policy of automatic promotion. Researchers have questioned the effectiveness of automatic promotion in enhancing the quality of education in schools (Ahmed & Dawit, 2015). Besides, teachers are not properly prepared to know the intricacies and management strategies of learners who are automatically promoted, this makes it possible for learners to carry their educational difficulties from level to level in the academic ladder (Chohan & Quadir, 2011).

Besides repetition and the introduction of the policy of automatic promotion, the Cameroon educational system is characterized by poor performance in language and mathematics, limited access to textbooks, large number of under-qualified teachers and high teacher-pupils ratios, especially in rural areas, major cities and urban areas. The problem of language and mathematics is more disturbing given that a recent study revealed that 49% of pupils in public schools have difficulties to read while 26.6% cannot make an attempt to pronounce a word or a syllable (School Achievement Report, 2011).

This is a clear indication that the quality of basic education in Cameroon has remained relatively poor over the years. A situation which warrants the adequate training of teachers and the enhancement of teacher development programs as a strategy of arresting the situation. The basic education sub-sector is the foundation of the educational pursuit of young Cameroonians. If the

foundation is poorly laid, it will be a clear indicator that the attainment of subsequent objectives will be an uphill task which might equally affect the quality at subsequent levels. However, a good professional development of teachers can significantly contribute to arrest these situations and bring about a meaning educational system at the primary school level. Besides, the quality of teacher education in the country can also be blamed for the poor quality of primary education in Cameroon. Before looking at the mode of training of primary school teachers, it is of great interest to know how it has evolved over time.

Brief History of Teacher Education in Cameroon

The formal training of teachers in Cameroon is a recent practice which dates a little older than 60years ((Tchombe & Agbor, 2017). Teacher education traces its root by the late 19th century when Alfred Saker in 1885 and the Roman Catholics in 1907 opened schools to train catechists and teachers to carry out evangelization (Lyonga, 2015). These teachers were taught the basic three Rs (Reading, Writing and Arithmetic). The first teacher training college in Cameroon was opened in British Cameroon in 1922 in Victoria (present day Limbe) but later moved to Buea with the name the Normal College. This institution trained student teacher to teach in lower primary school for duration of two years between 1977-1931. From 1932, student teaches who completed their teacher training course in the Buea Normal College were transferred to Kake (Present day Kumba) to further their education in teacher training. From 1945, the concept of teacher Grade II in Government Teacher Training College (GTTC) Kumba came up, where after other Teacher Training Colleges emerged training teachers of Grades I, II and II. (Fonkeng, 2007).

Prior to the 1980s, Cameroon had a total of about 26 Teacher Training Colleges, but due to the International Monetary Fund (IMF) structural adjustment plan, Cameroon closed 24 of these schools in the 1980s and the 1990s but later opened them in 1995 to train just grade I teachers (Tchombe & Agbor, 2017). Thus from 1995, following the recommendations of the 1995 Education Forum in Cameroon, the training of grades I and II teachers came to an end. However, today, we have Government Teacher Training Colleges in all Divisions of the country. The state equally boasts of lay private and denominational Teacher Training Colleges spread throughout the country and especially in major cities.

These schools admit student teachers on the basis of competition into the various levels of training. Students with a General Certificate of Education, Ordinary Level, are admitted for a training duration of three years. Similarly, those with a one paper pass in the General Certificate of Education, advance level are admitted for a training duration of two years and those with a pass in two papers and above in the General Certificate of Education Advance Level, are admitted to for a one year training course. During the respective periods of training, each term but for the third term, student teachers are placed on a four weeks teaching practice in various nursery and primary practicing schools in Cameroon. At the end of the of the study duration, student teachers sit in for the Teacher Grade One Certificate, which is an aptitude test, known by its French acronym as CAPIEMP (Certificate d'Aptitude Pedagogique d'Instituteur de l'enseignement Maternel et Primaire), comprising both theoretical and practical parts. Successful student teachers are then given a license to teach in nursery and primary schools.

Mode of Training Primary School Teachers in Cameroon

The model of teacher training in Cameroon needs to be reviewed if teachers are to effectively perform the task attributed to them and to contribute to the development of the Cameroonian economy (Tchombe & Agbor, 2017). These authors hold that teacher training in Cameroon is still largely theoretical and highly relies on a student teacher's ability to succeed in prescribed examinations. These teachers are trained to be subject specialist, capable of matching teaching practices to the ages of learners. These teachers are equally held accountable for the successes and failures of the learners, a situation which the researchers see as limiting the scope of teacher education and training because it views teacher education as a process of equipping teacher trainees with survival skills to manage the day to day running of the classroom and cope with classroom rituals. These researchers further intimated that Cameroon teacher trainees are trained pass across lesson content to learners and complete schemes of work and syllabuses without any emphasis on the quality of learning which the learners are undergoing. It is for this reason that the high rates of repetition in Cameroon primary schools and poor pupils' performance in Cameroon basic education have been blamed on the quality of teacher education in the country (Wirsiy, 2013). It is due to these weaknesses that some researchers proposed that for a good teacher training program to be developed in Cameroon, the program must consist of four elements which are selection pattern, program design pattern, specific duration and certification (Tchombe & Tambo, 1997). Given these identified lapses and the need to continuously adapting teachers to

latest educational practices which comes as a result of the evolution of the human society, the state has adapted some strategies of renewing and updating teachers' knowledge in various educational practices.

Strategies of Teacher Professional Development in Cameroon

The need for qualified teachers world over is a great concern, however, those who are tagged "qualified" still render teaching services whose quality is questionable (Education Sector Strategy Paper, 2006). This is so because the Grade One Teacher Training in Cameroon has been a serious problem to the Cameroon basic educational system due to the fact that entry qualification into these Teacher Training Colleges are not harmonized, while the content of the study programs are harmonized (Republic of Cameroon, 2010).

Given this quality of pre-service training pupil teachers under go in Cameroon, preparing them for actual teaching in nursery and primary school classrooms in Cameroon, it necessary for them to undergo continuous training in the field of teaching. Besides, no matter how great the quality of pre service teacher training is, the skills pre service teachers acquire in teacher training colleges is not sufficient enough to help them stand up to all the challenges they will encounter throughout their lives in the teaching profession (OECD, 2009). professional training is instrumental in helping them to stand up to the challenges faced by 21st century teachers, update teachers' knowledge in the light of recent developments in the subject area, update individuals' skills, attitudes and teaching techniques based on recent research in the field of didactics, exchange information expertise amongst teachers, maintain a high quality of teacher work force and to improve the quality of their practice as it is accepted that the quality of teaching is a main determinant in influencing pupils' learning (Koellna & Greenblatt, 2018) . These researchers make us to understand that due to the changes in the nature of education, there has been considerable shift in teacher education and most especially in the manner in which teachers' professional development is carried out. They belief that teacher professional development has shifted from one shot seminar where a more advanced teacher gives lectures to colleagues to a more professional paradigm in which teachers engage in communities of practice, unpacking content and examination of each others' work.

In Cameroon, the model which has been adopted to enhance the professional development of Cameroon Basic Education teachers, is the One Shot in-service workshop (Nkwenti, 2014

quoting The Inspectorate General of Pedagogy, 2004). The researcher holds that these workshops hold once every term, at the level of each sub division in a nearby school or at the sub-divisional delegation of Basic Education. From this, it can be deduced that teachers undergo professional development three times per academic year.

This model of teacher professional development adopted by Cameroon has been seriously criticized by researchers who think that it is ineffective in bringing about effective development in the teaching practice of teachers. Highly effective teacher professional development paradigms have a considerable shift from behaviourism to constructivism and sociocultural styles in which considerable efforts is placed on content, process and structure (Koellner & Greenblstt, 2018). In terms of Content, the researchers posits that it should focus on students “learning and Thinking” and in terms of process; teacher professional development should be a continuous. Taking this into consideration, researchers have recommended that an effective teacher professional development should hold for a minimum of 60-80 hours per academic year (Guskey, 2000; Supovic& Turner, 2000). As far as structure is concerned, in service teachers should be actively involved in the activities towards enhancing their professional development. According to (OECD, 2009),

Effective professional development is on-going, includes training, practice and feedback, and provides adequate time and follow-up support. Successful program involve teachers in learning activities that are similar to ones they will use with their students, and encourage the development of teachers’ learning communities. There is growing interest in developing schools as learning organisations, and in ways for teachers to share their expertise and experience more systematically.

The work shop that are organized by the Sub Divisional Inspectorate in Cameroon, aimed at enhancing Basic Education Teachers’ Professional Development, is inadequate in terms of time teachers spend on in service training, lacks continuity, follow up and teachers’ active involvement in the activities leading to their professional development. The one shot workshop adopted by Cameroon, is driven by theories of behaviourism, whereas recent methods of teacher professional development are driven by the theories constructivism and have been found to be very effective (Summey; 2013; Koellner & Greenblatt, 2018). One shot seminar is short, lacks follow up and monitoring mechanisms, thereby rendering it ineffective in bringing about any

meaningful change in teachers' belief, professional practice and pupils' academic performance (Mwaruma, 2013; Summey, 2013).

Statement of the Problem

Section 37 of the 1998 orientation law in Cameroon holds that teachers shall be the principal guarantors of quality education but contradictorily, some researchers hold that the quality of learning achievements of some learners in schools found in middle income countries like Cameroon have been poor (McAleavy, Hall, Horrocks & Rigall, 2018). Amongst other issues, this poor academic performance has been blamed on the low level of teacher professional development which does not give them the opportunity to be *the principal guarantors of quality education* as stipulated by the 1998 orientation law of education in Cameroon. To support the view that teachers are not sufficiently contributing to quality education to the fullest of their capacity due to the weaknesses of their Professional Development, the authors posit that a study carried out in developing countries of sub-Saharan Africa in 2018 by the world bank revealed that in countries like Kenya, Uganda and Tanzania, three quarters of grade three pupils could hardly read a sentence like “ the name of the dog is puppy” similarly, in rural India, three quarter of grade three pupils could not solve basic math problems involving two digit numbers like 46-17; and by grade five, half of the learners could not perform basic literacy and numeracy operations. The persistence of such weak quality of education is an indicator that amongst other causes, there is something wrong with the existing models used in enhancing TPD. A view supported by a researcher who intimates that the quality of teacher education is universally acclaimed as a means of improving the quality of education (Tambo,1995). To this, Burns (2016) purports that for teachers to contribute effectively in improving high quality education, they must be subjected to high-quality professional development which is actually lacking in in most developing countries like Cameroon. Such a scenario for education warrants a quick arrest through a modification of the strategies put in place to assure a high-quality professional development of basic education teachers as a means to guarantee quality education for nursery and primary school learners. This postulation is made on the grounds that when teachers go through meaningful professional development programs, the true final beneficiaries of the program are the learners and not the teachers themselves (Gaible & Burns, 2005).

As a means of resolving problems related to Teacher Professional Development, Cameroon introduced the one-shot workshop model of TPD. In contrast to the one-shot workshop model adopted by Cameroon, Gaible and Burns (2005) indicate that a good teacher professional development is continuous with follow ups and amelioration to ensure that teachers reach prescribed targets. Thus, the quality of the one-shot model of teachers' professional development chosen by Cameroon which usually lasts for just a day, has been questioned by experts for being inadequate in meeting the demands of teachers (Mwaruma, 2013). This view has been supported by another researcher who observed that in order to up skill nursery and primary school teachers in the teaching of ICT in Cameroon, the one-shot model of TPD is being used (Nkwenti, 2014). The researcher is of the opinion that the one-shot workshop model is not solid enough in ensuring the quality of professional development needed to ensure pupils' acquisition of quality education. Similarly, the professional development of teachers in Cameroon to acquire skills in pedagogy is done through seminars and workshops which usually last just for a day and at most a week, a practice which is not suitable enough to enable teachers acquire the type of skills they need to effect meaningful teaching in their classrooms.

Moreover, during such workshops and seminars, teachers leave their classrooms and even their place of work and travel over long distances to take part in professional development programs. During this period, learners are left to themselves, work coverage becomes grounded and no meaningful learning is acquired due to the absence of teachers (Nkwenti, 2014). Besides, other researchers have postulated that this one-shot seminar has been proven to be costly and has been inadequate to motivate teachers and improved their skills in teaching (McAleavy, Hall, Horrocks & Rigall, 2018). These researchers advocate that the reason for such shortcomings of workshops stems from the fact that workshops lack practicality, specificity and continuity, which to them are the principal indicators of a good professional development training program. As a solution, researchers have intimated that teachers prefer a TPD model which is continuous with subsequent sessions relying on the previous sessions (Davis 2020; Guskey, 2000; Supovic & Tuner, 2020). The teachers also intimate that they prefer a TPD model which is presented on a variety of formats like audios, videos and chats (Seidel, Sturner, Bloomberg, Kobarg & Schmidt). Yet another set of researchers found out that a meaningful teachers' professional development model should be formulated based on the expressed needs of the teachers (Galaczi, Nye, Poulter &

Allen, 2008). All these preferences are absent in the one-shot workshop model. Thus, a probable reason why teachers do not benefit much from it.

That notwithstanding, the one-shot workshop model of TPD adopted by Cameroon does not include teachers in the policy making process leading to their own professional development. Such is the case as Koellner and Greenblatt (2018), Summey (2013) and Loganathan (2008) all postulate that teachers need to be actively involved in all decisions leading to their professional development. Loganathan (2008) further buttresses the point by revealing that when teachers are involved in educational decision-making process, they become key actors in ensuring that whatever policy that is adopted should succeed as they are the key actors in rolling out policies. Therefore, one of the major hindrances to the effectiveness of teacher professional development programs in the exclusion of teachers in all the planning phases, (Kahigii, Danielson, Hansson. Ekenbery&Tusubira 2009).

It is based on these that the researcher sought to find out an alternative means of enhancing meaningful professional development of teachers by examining the efficacy of mobile based learning in enhancing the Teacher Professional Development of nursery and primary school teachers in Cameroon.

Objectives of the study

The researcher formulated the following objectives to guide the study.

General Objectives

Generally, this study sought to experiment the efficacy of the mobile model in enhancing the professional development of nursery and primary school teachers in Cameroon.

Specific Objectives

Specifically, this study seeks to:

- Identify the weaknesses underpinning the one-shot model of teacher professional development in nursery and primary schools in Cameroon.
- Map out teachers' preferences in the design of a teacher professional development model through the use of mobile learning.

- Suggest policy orientations that could foster the smooth implementation of mobile learning within nursery and primary schools in Cameroon.
- Test the developed mobile model of Teacher Professional Development among a cohort of nursery and primary school teachers in Cameroon.

Research Questions

For the effective attainment of the objectives, research questions were formulated to guide the study. Research questions were used because it allows the researcher to widely explore and explain the research topic as stipulated by Kenneth (2007), Hasa (2016), who believes that such wide exploration allows the researcher to report a wide range of findings. In this light, the following research questions were formulated to guide the study;

General Research Question

Does the mobile model of Teacher professional development significantly improve the professional development of nursery and Primary school teachers?

Specific Research Questions

From the forementioned general research question, the following specific research questions were formulated to guide the study:

- What are the weaknesses underpinning the one-shot model of teacher professional development in the nursery and primary schools in Cameroon?
- What are teachers' preferences in the design of a teacher professional development program through the use of mobile learning?
- Which policy orientations could foster the smooth implementation of mobile learning within the nursery and primary education sub-sector?
- What are nursery and primary school teachers' performances after pursuing a professional development program through mobile learning?

Significance of the Study

This study will be instrumental to:

Cameroon policy Makers

This piece of work will be instrumental to policy makers in that it will let them understand the various policy orientations which can guide them in formulating a policy which integrates mobile technology into the TPD process. This is due to the fact that the one-shot workshop model of professional development used in Cameroon has been proven to have a number of lapses as stipulated by researchers such as Guskey (2000); Supovic and Turner (2000) as well as OECD (2009). Thus, there is a need for a strong policy to be put in place to guide the technology integration process into TPD practices. Thus, this study will help policy makers to make a decision on which policy orientation to adopt in order to improve the quality of teachers' professional development.

In addition, this study will be beneficial to policy makers in that it will help policy makers to include teachers in the decision-making process leading to their professional development. It has been proven that when teachers are included in decision making regarding any policy, they ensure that the policy works as they are at the pivot in rolling out policies Koellner and Greenblatt (2018), Summey (2013) and Loganathan (2008). The inclusion of teachers in the decision-making process will help policy makers to better plan as teachers will be able to reveal what their needs really are, so that the needs can be included in the teacher professional development activities.

Teacher Educators

This study will be useful to teacher educators in that it will help them to be aware of the preferences of teachers which could be used in designing a meaningful teachers' professional development package. This is so because the characteristics of traditional TPD designs, varies significantly from the characteristics of modern designs of TPD. Thus, this study will shade more light on the use of mobile technology in TPD curriculum which includes be continuity, collaborative, self-paced, studied at learner's convenience and centred on problem resolution (Stack, 2015).

Curriculum Designers

The study will further be useful to curriculum designers in that it will assist them to select the most appropriate channel through which designed curriculum for TPD could be disseminated to teachers. This is due to the fact that if a TPD curriculum is well designed, but the wrong channel

is used in delivering the curriculum, the quality of output might be significantly negatively affected. Thus, with the presentation of the various channels through which teachers can undergo their professional development, curriculum designers can then choose the channel through which the designed curriculum can be delivered.

In service Teachers

This study will be useful to in service teachers in that it will educate them on the possibility of using a more meaningful model of undertaking their professional development. This is due to the fact that teacher professional development is not done for the sake of the teachers but as a means to improve the academic productivity of learners who are considered as the final beneficiaries of teacher professional development program (Gaible & Burns, 2005). Thus, this study will bring to mind the significant role teacher professional development plays in the professional life of the teachers and the academic success of their pupils, who are the main reasons for all projects carried out in the academic enterprise.

Delimitation of the Study

Geographically, data shall be collected from private and public nursery and primary school teachers in all the ten regions of the Republic of Cameroon to develop the Interactive Mobile Technology (IMT) model. The IMT model shall be tested in some nursery and primary schools in the Mfoundi Division of the Centre Region.

Contextually, this study is delimited to the use of mobile learning in enhancing Teachers' Professional Development of nursery and primary school teachers in Cameroon.

Justification of the Study

Researchers have proven that improving the quality of teachers' professional development can significantly boost their productivity, leading to an improvement in the overall performance of learners. However, different educational systems have adopted different strategies to enhance their Teachers' Professional Development. In Cameroon, the one shot model of TPD has been adopted to enhance the quality of Cameroon's Teaching staff in nursery and primary schools in the country. This model has been largely criticized for being too weak in meeting teachers' professional development needs which accounts amongst others for the falling educational standards in the country's nursery and primary schools. The country has embraced the use of

technology in its educational system. However, the use of technology in Cameroon educational system is still centred around teaching and learning in schools as well as in administration with no effort made so far in using technology in TPD. This study thus seeks to find out if the mobile model of TPD development can improved on the quality of TPD in Cameroon's nursery and primary schools, without which Cameroon will continue with the one shot model of TPD with its perceived weaknesses.

The weaknesses of the one-shot model of TPD will not bring about an improvement in the Cameroon educational system. This study will thus bring an insight to the weaknesses of the one shot model of TPD and educate the educational community of the effectiveness of the mobile model of TPD in improving the quality and effectiveness of TPD.

Definition of Terms

In this part of this work, the key terms have been presented and defined as used in the study.

Mobile Learning

This is the use of easily moveable learning devices like smart phones and tablets in the learning process (Altissia, 2013). It can also be defined as a learning effort in which the main channel of delivery is through hand held technological devices (Traxler, 2017). In this study the word mobile learning has been use to stand for a learning scenario in which learners are teachers are not found in a physical environment, but rather they are connected through all wireless handheld technological devices which are portable for users to carry from place to place with little or no inconvenience. These technological devices in this case include palm tops, tablets, mobile phones and perhaps laptops.

Curriculum

Though this concept does not have a universally accepted definition, the most frequent used definition refers to it as all the engagements or experiences learners have under the auspices of a school (Tambo, 2012). However, Tambo makes mention of the fact that this definition has been criticized for being too broad and limited, then he goes further to quote Kauchack, Eggen and Carter (2002) who define curriculum as what students learn in school. In this study curriculum has been used to signify all a course of study or a learning program to guide teaching and learning.

Teacher Professional development

This is a set of strategies taken to ensure that teachers are at breast with new knowledge and new teaching methodologies so as to improve the quality of their output (Alvados, 2017). It can also be defined as a systematic effort to bring about change in the classroom practice of teachers, in their classroom practice, beliefs and students' performance (Guskey, 2012), thus it can be said that teacher professional development are efforts which focus on bringing about a change in the belief of teachers towards the teaching exercise, which influences the manner in which they teach and they way students perform academically.

Nursery School

This is a formal educational institution or learning space providing early childhood learnings to children between the ages of 4-6 before they begin compulsory education in primary schools. Nursery schools may be owned by the state or private partners to education.

Primary School

This is a formal educational establishment which provides learning to children between the ages of 6-12. It is compulsory for all children of the mentioned ages to enrol in primary schools to acquire fundamental skills needed for life.

Basic Education

Basic education refers to a broad pool of knowledge that any one, adults, youths and children are entitled to at any stage of their lives, as a right (UNESCO, 2007). Basic education is considered as a foundation of lifelong learning which countries need to develop as a means of furthering higher level of education and training. The report of 1990 Jomtien conference on education advocates that basic education must respond to actual needs, interests and problems of participants in the learning process. However, in this study, basic education has been used to refer to nursery education and the first six years of schooling in a formal institution of learning.

Efficacy

In the context of this study, efficacy has been used to refer to the the power or ability of a person to produce a desired result.

ICT

ICT is an acronym for Information and Communication Technology. It covers any tool that can store, retrieve, manipulate, transmit or receive information electronically in a digital form. These tools include computers, tablets and smart phones.

Model

It is a representation of a person or a thing or a proposed structure, typically on a smaller scale than the original. Models are primarily used to visualize an object or system and they are often created from experimental data.

Teacher Professional Development

This is a set of tools, resources and training sessions for practicing teachers to ameliorate the quality and effectiveness of their professional practices. The resources permit educators to advance their knowledge in their respective subject areas as well as in pedagogic practices.

Summary

This chapter contains an overview of the study, introducing key issues that will guide the research project. An overview of the Cameroon educational system was done alongside the present state of of teachers' professional development in nursery and primary schools in Cameroon. The problem which this research study aims at resolving was presented as well as the objectives and the research questions which guided the study. In the course of this chapter, the study was delimited and the significance of the study presented. The chapter closes with definition of key terms as used in the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The quality of an educational system cannot exceed the quality of its teachers (Barber & Mourshed, 2007). This is so because teachers are the principal guarantors of quality education. A neglect of teachers is synonymous to neglect of the quality-of-service delivery in educational institutions. It is against this backdrop that teachers are supposed to be constantly involved in professional development to meet the needs of the ever-changing educational landscape (Guskey, 2000). Teachers' professional development is a process and not an event, thus constant interaction amongst teachers and their supervisors on issues affecting the quality of their service delivery is a good strategy to ensure the quality of learning going on in schools. Various models presented in page 70-80 of this study have been proposed to ensure high quality of Teachers' Professional Development (Tingley, 2020; Burn, 2001 & Stanfield, 2017).

However, researchers think that whatever model is chosen or proposed, the said model must meet teachers' pedagogic needs, encourage interaction between teachers and their supervisors, be continuous and be accessed through different platforms as a strategy to enhance flexibility.

Moreover, in designing a model, it is incumbent on the designer to involve teachers in the design process as a means of ensuring that teachers implement the policy to the latter (OECD, 2019). The routine has been for governments and school supervisors in low-income countries like Cameroon to sit in their offices with very little clue of the challenges teachers truly encounter in the instructional process and design teacher professional development packages without consulting the teachers and hence fall short of teachers' expectations. There is therefore a need to involve teachers in the design of a PD package which meets their aspirations and at the same time respecting the attributes of a good TPD model.

In this chapter, scholarly articles, books, and other sources relevant to this study have been reviewed and analysed in detail. The researcher carried out a thorough review of literature on the key variables related to this study which were aimed at answering the research questions. The

researcher went further to review literature on theories which will guide the study as well as propose a conceptual framework to develop and test a befitting model to enhance Teachers' Professional Development.

Theoretical Review

Theoretical framework is a blueprint for an entire dissertation (Grant & Osanloo, 2014). Other researchers hold that a theoretical framework is based on existing theories in the area of a given research work and which is related to the hypothesis of the study (Adom, Hussein & Adu, 2018). Theoretical framework can thus be seen as a plan which is borrowed by a researcher to build his own research inquiry. These researchers hold that without a theoretical framework, the structure and vision of a research work will be unclear, just like a house constructed without a plan. The importance of theoretical framework in a study cannot be over emphasized as it the foundation on which all knowledge is constructed. The theoretical framework can be likened to a map of travel which guides the research from deviating from the acceptable beliefs in the field in which the researcher is carrying out his research work (Sinclair; 2007; Krenovich; 2010).

Thus, to effectively guide this research work, the researcher chose the following theories to be the blueprint or a road map for this study: the socio-constructivist theory by Vygotsky (1978), Connectivism by Siemens and Downes (2005), Community of practice by Weiner (1998) and Technology Acceptance Model. Each of these theories have been reviewed in line with the study at hand.

Social Constructivism Theory

The social constructivist theory by Lev Vygotsky (1978) holds that the social environment plays a significant role in the learning process, an idea which is congruent with the postulations of Lave and Wenger (1998). They posit that teachers' professional development is enhanced when they interact on a social platform. The theory of socio constructivism investigates the importance of a social learning environment in helping learners construct their own knowledge by themselves (Jim, 2013). By this, Jim suggests that a social environment which is stimulating is capable of helping learners to construct their own learning. Vygotsky's theory came up as a protest to the cognitive development theory of Jean Piaget who purported that a child's learning precedes his development (Saul; 2018). Vygotsky instead holds that social learning comes before cognitive development, thus it is the child's interaction with the environment which provokes the learner's

cognitive development. Thus, when teachers interact with each other, sharing their experiences and adopting best practices on a social platform, their professional development is enhanced.

Vygotsky (1978) opines that an individual's cognitive development cannot be understood without reference to the social and cultural context within which the individual is found. The researcher holds that cognitive development first starts as a collective effort and only later shifts to the individual level. Vygotsky thus criticizes Piaget's idea of universal stages of cognitive development and clearly stipulate that cognitive development stems from social interactions from guided learning experiences within the zone of proximal development as learners co-construct knowledge with their mates. Contrary to the stipulations of Piaget who advocates that cognitive development stems largely from independent explorations in which the learner construct knowledge by themselves void of their mates (Saul; 2018). In such a case, the environmental elements are capable of provoking learners to think in a particular way in order to develop their knowledge. Thus, the use educational technologies in an academic milieu is capable of provoking learners into deep thinking which is necessary for constructive learning.

Shuword, Howard and Facundo (2006) point to the fact that to understand the theory of socio constructivism, one needs to first and foremost understand two underlying principles in this theory. One needs to understand the More Knowledgeable Others (MKO) and the Zone of Proximal Development (ZPD).

i. More Knowledgeable Others (MKO)

Vygotsky (1978) holds that for a learner to be able to construct his or her own knowledge, he/she needs to be in constant interaction with the More Knowledgeable Others. More Knowledgeable Others in this case refers to teachers, and other adults. Besides teachers and other adults, Shuword, Howard and Facundo (2006) indicate that More Knowledgeable Others could mean a learner's peer or even other learners who are academically advanced than the learner in question. They move this argument forward to suggest that More Knowledgeable Others could also stand for other technologies build with learning materials through which or from which learners can learn. Besides, the More Knowledgeable Other might not necessarily by an older adult nor a teacher or even technology. The MKO can also be the learner's peers or an adult's children (Saul, 2019)

From the fore going it can be deduced that if teachers are in constant interaction with more experienced teachers and their supervisors on various web based learning platforms , the teachers will be capable of constructing his/her knowledge and carry out self-professional development. Chang, Johnson and Chan (2005) makes it clear that when a learner is using educational technologies in the learning process, when he/she is faced with a problem he/she first of all thinks of searching answer to the worry online, ever before consulting a teacher or other peers who are more advanced in learning. In a situation where he finds the answer to the question, he/she has then construct the required knowledge by himself through a More Significant Other known as the Internet. Thus, allowing teachers to browse the web and asking questions on professional development social medium, can help teachers develop and insight into their professional problems and thereby enhancing the quality of their teaching.

This then enlightens us on the significant role played by educational technologies in helping teachers in the construction of their own knowledge. This is because educational technologies which are a part of the social learning environment are capable of provoking thoughts on the part of the teachers. It further gives teachers the opportunity to formulate hypotheses and use the internet as a medium to verify these formulated hypotheses.

A research paper by Education Broadcast Cooperation (2004), titled construction as a paradigm for teaching and learning, calls on constructivist school supervisors who use educational technologies as the More Knowledgeable Other to constantly help the teachers to evaluate how the media is helping them achieve set professional development goals and objectives. By so doing the supervisor is helping the teachers to learn how to teach and evaluate themselves. This paper purports that if such activity is carried out regularly, then teacher using educational technologies will grow in professional development.

ii. Zone of Proximal Development (ZDP)

The Zone of Proximal Development (ZPD) according to Vygotsky (1978) is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. We therefore deduce here that the Zone of Proximal Development is the area between what a learner can do with the help of a More Significant Other

and what the learner can do independently. It is thus, that stage in learning between what a learner can do independently and what he can accomplish with the help of an academic guardian.

The ZPD is a pointer to the fact that teachers are in constant need of help in order to make them succeed in their practice of teaching. Thus, teachers who are in their ZPD need help from their supervisors and colleagues. Learning materials can be scaffolded on a technology enhanced learning platform by the More Knowledgeable Others who at this point can be their supervisors and more experienced colleagues.

Vygotsky, further suggests that at each stage in the learning process, a learner is found at a ZPD and needs help known as scaffolding to cross over to a Zone of independence. In web-base curriculum, the learner constructs his own knowledge base and the tutor who and or technology which could be considered as a More Knowledgeable Others, work in helping this learner who is at a Zone of Proximal Development to find solutions to his/her problems (Akyalcin 1997). It is for this reason that Wilson (1997) opines that web-based curriculum is more objective with lots of focus on the theory of constructivism. Thus, the supervisors, more experienced colleagues and technological tools are considered as a guide in web-based learning, capable of helping the teachers get out of their Zones of Proximal Development.

Vygotsky believes that when a learner is found at the one of Proximal Development facilitators need to provide appropriate assistance which will give the learner the courage to stay on and achieve the task. To assist a learner move through the Zone of Proximal Development, facilitators are encouraged to focus on three important components which aid the learning process (Saul, 2019). To the researcher, the three main elements are as follows:

- The presence of someone with knowledge and skills beyond that of the learners (More Knowledgeable Other) which in the case of this study are education supervisors and experienced colleagues.
- The learner maintains a strong Social interactions with a skillful tutor that allow the learner to learn and practice new skills. Which in the case of this study are maintained interactions between teachers, educational supervisors and mobile learning platforms on which professional development contents are made available in different formats like videos and audios and postulated by Seidel, Sturner, Blomberg, Koberg and Schimdt (2011).

- Scaffolding or supportive activities provided by the facilitator or the more significant other to support the learner as he/she move through the Zone of Proximal Development. Which in the case of this study are the video, audio and text contents which are provided to practicing teachers.

Thus, the Zone of Proximal Development which is also known as the Zone of Potential Development is a concept often used in the classroom to help learners with skill development. As seen in the preceding paragraphs, when a teacher is found at the ZPD, education supervisors and more experienced teachers are expected to provide guidance to unblock the teacher who is stocked in the course of performing his/her task. This is based on the fact that every person has two stages of skill development (Vygotsky, 1978). These two stages are:

- A level they believe they can achieve by themselves
- A level they can achieve with the help of an experienced mentor or teacher

The Zone of Proximal Development is broken into three overlapping stages (Yetman, 2020). These three overlapping stages are as follows:

1. **Tasks the learner can do without assistance.** This category includes everything in the learning process which a learner can do without help from the More Knowledgeable Other. They are those tasks a learner can carry out without the guidance of the More Knowledgeable Other. These are those tasks the learner has already learnt and is proficient in.
2. **Tasks the learner can do with assistance.** This category includes tasks a learner can't work through by themselves but can effectively execute the task with the help of a more knowledgeable other, also known as their ZPD. These refer to those learning tasks which learners cannot perform on their own but need appropriate guidance as propounded by (Akyalcin, 1997).
3. **Tasks the learner can't do with assistance.** The final category includes learning tasks that are excessively difficult to for the learner to perform even with help from the more knowledgeable other. For example, a young child might be able to spell out their own name by themselves but might need help from someone else to write the complete alphabet. The task is above their skill level and outside their ZPD.

Vygotsky believes that when a student is at the ZPD for a particular task, providing the appropriate assistance (scaffolding) will give the student enough of a "boost" to achieve the task. Once the student, with the benefit of scaffolding, masters the task, the scaffolding can then be removed and the student will then be able to complete the task again on his own.

When a teacher finds himself in the ZPD, Sawyer (2006) holds that this teacher can turn to a More Knowledgeable Other who might be an education supervisor, a more experienced teacher or a piece of assistive technology. From this idea, it now becomes possible to explain the reason for which recent years have become known as the information age, where teachers who are in doubt or who are in need of information out rightly go online in search of needed information to clear their doubts or accomplish a task. However, the situation to effectively move a teacher from the Zone of Proximal development, the teacher needs to be scaffolded (Bruner, 1959).

iii. Scaffolding

Sawyer (2006) holds that scaffolding is an element of the socio-constructivist theory. The scaffolding theory was brought forth by Bruner (1959). By scaffolding, Bruner (1959) believes that it is the help given to a learner who is at a Zone of Proximal Development to help him achieve a goal.

Sawyer (2006) also believes that there are three essential features of scaffolding that facilitate learning. The first feature has to do with the interaction between the learner and the expert. This interaction should be collaborative for it to be effective. The second, learning should take place in the learner's Zone of Proximal Development. To do that the expert needs to be aware of the learner's current level of knowledge and then work to a certain extent beyond that level. The third feature of scaffolding is that the scaffold, the support and guidance provided by the expert, is gradually removed as the learner becomes more proficient.

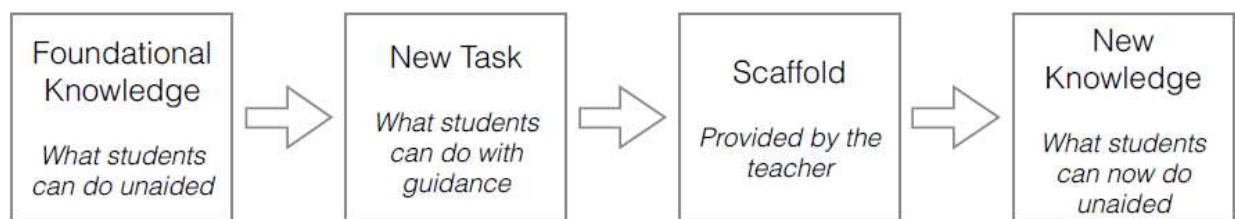
Thus, teachers who are in their Zones of Proximal Development could be scaffolded by interacting with their supervisors and more experienced colleagues on the difficulty the teachers are facing and constantly providing guidance and follow ups until the teacher becomes proficient in the area of the teaching function.

Bruner postulates that the support and guidance provided to the learner is compared to the scaffolds in building construction where the scaffolds provide both "adjustable and temporal"

support to the building under construction. The support and guidance provided to learners facilitate internalization of the knowledge needed to complete the task. This support is weaned gradually until the learner is independent to accomplish a given task.

Bruner is thus of the opinion that when learners begin learning an activity, they need a lot of support from their teachers, peers, parents and in recent days by technology. He suggests that if these learners are left on their own they will be unable to accomplish the tasks. Bransford, Brown, and Cocking (2000) are of the opinion that when there is a deficiency in guided learning experiences and social interaction, learning and development are obstructed. The process of scaffolding can be graphically represented as follows:

Figure 3: Graphical Representation of Scaffolding, adapted from Lee (2014)



As propounded by Yetman (2020), in the course of the scaffolding process, the teacher can use the following techniques in enhancing the scaffolding of learners:

- modeling
- providing examples
- working one-on-one with students
- using visual aids

Yetman (2020) propounds that the scaffolding of learners provides a series of advantages to the instructional process. The researcher equally suggests that Scaffolding provides a student with a supportive learning environment where they can ask questions and receive feedback. The following are just some benefits of scaffolding a learner:

- motivates the learner
- minimizes frustration for the learner
- allows the learner to learn quickly
- provides a personalized teaching experience
- allows for efficient learning

Role of Technology in Socio Constructivism

Lee holds that to use the Integrated Learning Environment (IVLE) to further meaningful learning, six principles must be respected. Out of these six principles, the first five are used outside the classroom and the last one is used inside the classroom. These principles as presented by Lee (2014) are as follows:

Lesson plan

He explained that he uses IVLE lesson plan to connect all the instructional resources for a module, and as a one-stop location for students to access these resources. He suggests that the topic approach should be used compared to the commonly adopted weekly approach, this is so because the topic approach can easily act as an index for lecture notes and remains accurate on a year-to-year basis as it is independent of changing national holidays.

Lee Purports that Five to six different concepts should covered each week. Each topic in the lesson plan should consist of:

- **Play-lists** – to allow students to access the online lectures in the recommended sequence before the face-to-face lessons
- **Weblinks**– to provide additional materials, wherever necessary, to enhance student understanding
- **Online quizzes** – to test student understanding of concepts. Each quiz consists of about 10 MCQ or “fill-in-the-blank” questions
- **Multimedia tutorials** – to support the various class exercises through tutorials that discuss the concepts handled.

- **Spreadsheets** – to enable students to work out problems, thereby boosting understanding through interactive visualizations.

Online quizzes

Online quizzes should be used to understand what students don't know. Students should watch lecture videos before class (a flipped classroom approach), and take a short quiz on the lecture content. Each quiz question should be designed as a Multiple Choice Question (MCQ) type or "fill-in-the-blank" type, but it should also require students to provide a rationale for their chosen answer. Each student should be given 5 attempts. When a student gets a question wrong, feedback should be provided along with a hint pointing to the right answer. The rationale students provide for each MCQ question will give insights on what students don't know. Lee explained that focus should be mainly on students' first attempt of the quiz, as this can act as a good gauge of students' understanding. He said that this information should be used to fine-tune lectures, to pick out discriminatory questions and address student misconceptions.

Interactive visualizations

Lee postulates that excel spreadsheets should be used to design interactive visualizations. For each question appearing on the online quiz, students should be provided with at least one related interactive visualization. Students will be allowed to interact with these visualizations while attempting the online quizzes. They will be able to visualize changes that occur when changing the values provided in the spreadsheets.

Peer assessment

Peer assessment is an important component that should be used to enhance student learning. Lee proposes that peer assessment should be to get students to assess their peers' essays. He suggests that a grading rubric should be provided that students can use as a guide while marking. Finally, he intimates that feedback should be returned from the peers back to the individual students. Each student should get to mark at least 3 essays. This allows students to see other's work compared to their own essays. In addition, students should also get to mark their own essay after having marked their peers' essays. This acts as a reflective element for their own learning.

Thus, with peer assessment, students get an opportunity to observe their peers' learning process and also be able to get a more detailed knowledge of their classmates' work. This fosters increased responsibility in students, enabling students to be fair and accurate when assessing their peer's essay, thereby making fair judgments, while also aiding in self-assessment of their own work.

Online tutorials

Lee suggests that online videos tutorials should be created. These online video tutorials guide students through some of the main ideas discussed for a particular topic and allow them to work on their homework assignments without the need for them to attend lectures. These videos should however be carefully selected in such a way that it meets learning needs. The videos are also supposed to be related to the context of the learners, as the learners' local cultural characteristics should feature in the video.

Learner response systems

Learner response systems like Short Message Systems (SMS) and pop up messages should be used as a formative assessment to guide teaching, to measure what students are thinking and then address it immediately in class. They can be used to check students' prior knowledge, probe their current understanding, and uncover student misconceptions. They can also provide feedback to the instructors about their students' understanding and to students about their own understanding.

Connectivism Theory

In the socio constructivist theory, Vygotsky intimates that, learners are constantly in a Zone of Proximal Development and tutors should constantly provide help and assistance to get them out of the ZPD. In the case of teacher professional development, the teachers are constantly in need of help and guidance from more experienced colleagues as well as from education supervisors. In the connectivist theory, Siemens and Downes (2005) are of the opinion that such help and guidance can be done by maintaining a constant connection with the use of technologies between the teachers and the education supervisors.

Connectivism is a theory which gives a direction of how learning is facilitated in the 21st century (Marquis, 2012). This theory holds that man lives in a global village of interconnectivity. This interconnectivity has also been characterized by the sharing of knowledge across different quarters through the use of different technological tools (Downes & Siemens, 2005). These researchers are of the opinion that knowledge is now open, for all to receive through different technologies.

This theory calls for the rethinking of the place of the teacher, learner and the changes technologies have brought in the teaching/learning process. This theory has been proposed as a replacement for the classical theories of behaviourism, cognitivism and constructivism (Besty, Ginger & Mark, 2013).

Behaviourism, cognitivism and constructivism are three great theories are usually used in the creation of learning environments, however, they were developed at a time when technology had no impact on the teaching learning process (Downes, 2005). Researchers have criticized these mainstream theories on the basis that they failed to explain how conceptual changes take place because they did not explore mental processes or what goes on the mind of a human person (Yilmaz, 2012).

Downes and Siemens (2005) are for the fact that there is a dire need for a new theory to explain the nature and process of teaching and learning in recent times largely characterized by the plethoric use of technology in every sector of human life. As observed, over the years, technology has impacted the manner in which we learn, communicate and how man lives. It is for this reason that the researchers propounded the theory of connectivism.

Connectivism comes as a result of the weaknesses the classical learning theories. The classical learning theories have over the years used experience as the best teacher of knowledge, a view which the connectivist disagree with. The connectivist theory is a learning theory which explains how internet technologies is creating new engaging opportunities for people to learn and share ideas with the use of the World Wide Web (Siemens, 2005 &Downes 2010). To these researchers, these technologies associated to the internet included web browsers, emails, social learning platforms, wikis, you tube and a host of others.

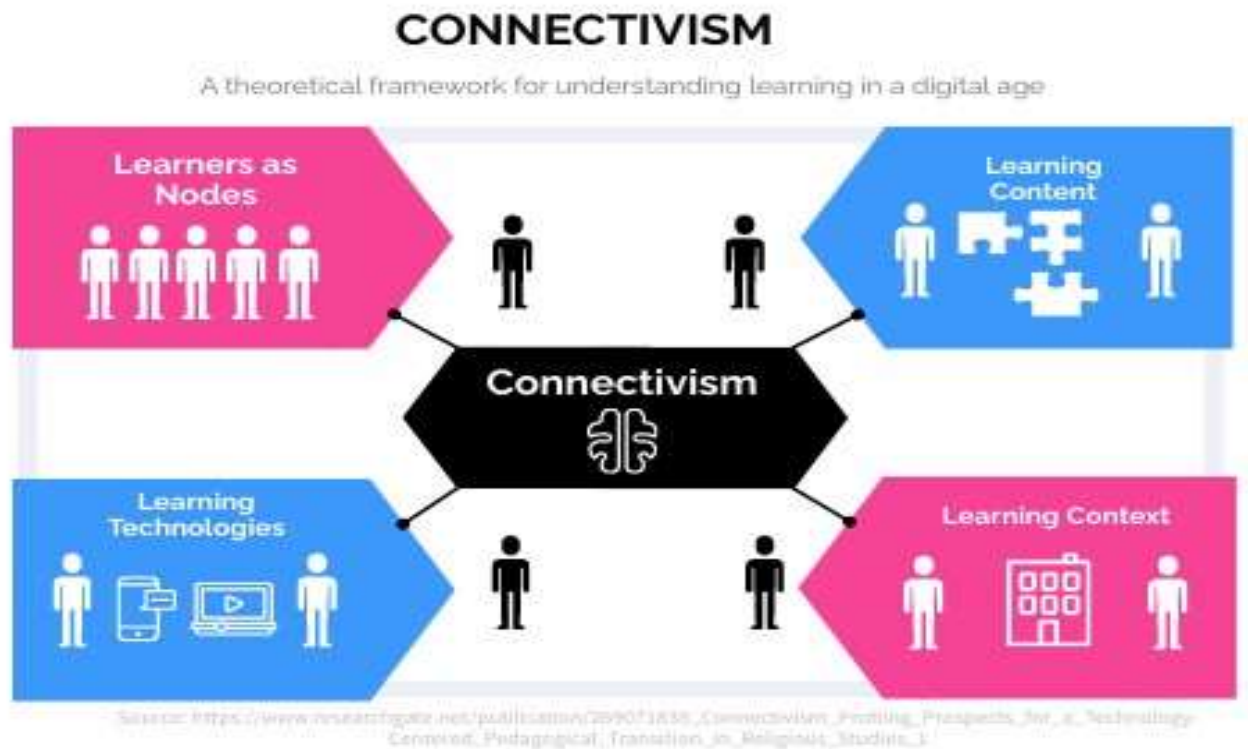
A key element of the connectivist theory is based on the fact that much learning can take place between peer networks and it should be noted that all these essentially take place online. The connectivists hold that, in as much as experience is a teacher of knowledge, everything cannot be experienced, rather connections with other people around the world can enable us gain much knowledge. Connections can be done through networks which can be defined as connections between entities (Downes, 2004). Such entities are principally various technological platforms on which various educational stakeholder interact on in order to ensure the adequate acquisition of knowledge and skills by learners.

The researchers further intimate that computer networks, power grids and social networks functions on the principle that entities, systems, nodes, groups can be connected to form a single whole. A break on one element of this whole has triggering effects on the other parts of the whole. This therefore supports the view point that learning is a process which occurs within nebulous environments of persistent shifting core elements which cannot actually be under the control of any one person (Siemens, 2005). The researcher further postulate that the starting point of the connectivist theory is an individual, in which the individual's knowledge is a network which once it feeds into an institution, the institution continually feeds back the network of knowledge. He then suggests that the connectivist theory is based on the following principles:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialized nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision

(Marquis, 2012) suggests that the principles of connectivism can be applied in the teaching field in the following ways:

Figure 4: A theoretical framework for understanding learning in a digital age adopted from Yilmaz, (2012).



Connect Learners Nodes – This attribute insists on the systematic use of technological devices to help learners to establish a connection or a relationship that exists between concepts of instruction. The use of software and database tools to explore the relationships between seemingly unrelated pieces of data in the instructional process is prima in the characteristics of today’s educational process. Such situation is very glaring in adult education which is usually characterized by self-paced learning.

As a consequence, various online learning platforms can help teachers to connect to each other and share experiences and best practices with the aim of developing their professional competences in the teaching function. Vygotsky (1978) and Hagg (1999) is of the opinion that these connection is to be constant

Diversity of Opinions – Here, the researcher suggests that the teacher is expected to use the Internet network and other social fora like whatsapp, facebook and zoom to expand classroom

discussions beyond the conventional classroom, school, local community, and even a nation as a means of integrating the wider variety of human experiences and expertise that is available and can contribute to understanding the way the world and education in particular works. When this is the case, chance is given to a wider population to access and participate in educational matters. This is so as social media classrooms enable learners to connect with other learning groups and other educational systems, they use social media to get meaningful educational information and make learning convenient (Khanyie, 2019).

Thus, the entire concept of teacher professional development rests in a diversity of opinions where teachers come together in a wider community of professional teachers from diverse backgrounds through a medium to exchange and share their pedagogical experiences and learn from one another. The sharing of experiences will help teachers move from their respective zones of proximal development as propounded by Lev Vygotsky (1978).

Non-human Learning – Non human learning refers to the various technological appliances through which learners can get information. Before today, the main source of educational information was the teacher. But as the society and educational practices evolve, there is a considerable shift from the teacher to non human appliances as the main information provider for the educational system. Siemens and Downes (2005) accepts that the pace of information generation is beyond what humans can comprehend and allow students to lean on technology to the extent necessary in order to make use of the vast amounts of information available to them. Having all of the world's books in your pocket (through the use of mobile devices like smart phones and tablets) is an amazing resource – a teacher's role is to help students develop the skills necessary to interface with the tool and make sense of what they access, which calls for a shift of the teacher as the main information provider to that of a guide and a facilitator to enable learners access the kinds of information they need to accomplish their educative tasks. To do this, the teacher is expected to give task to the learners and guide them on where to get the information. The students on their part are expected to carry out research online and express their findings to the teacher and to their other peers either on a face to face mode or online (Siemens, 2005 &Downes 2010)

Know More – The society is now driven by knowledge, where there is a massive and speedy expansion of knowledge and society dwellers must continuously update their knowledge to suit

the ever changing needs of the society. As information expands teachers and learners need to develop strategies for continuing to incorporate new data, knowledge, and concepts into their existing world view.

It is for this reason that Van (2017) thinks that government and cooperate bodies are aware of the speedy rate of information obsolescence in the information society, reasons for which they are investing huge sums in the continuous training of their respective workforce. Contrarily, failure to continuously invest in the continuous training of the human capital, will lead to low productivity and even the production of irrelevant goods and services. In a connectivist world, (Downes & Siemens 2005) hold that learning can never stop. There will always be something new to grasp and make sense of through the various devices which are available to the learner.

This is thus a pointer to the fact that teaching is not a stagnant profession, there are newer pedagogical approaches which spring up from time to time based on research findings and experience. Thus, teachers on their part are to ensure that they update their professional knowledge constantly through professional development programs in order to adapt to the ever-changing educational land scape.

Maintain Connections – Downes and Siemens are of the opinion that to thrive in today's knowledge society characterized by the heavy use of technology; people must create and maintain connections with different stakeholders. To the researchers, it is critical to not only maintain existing connections but also to cultivate new ones. This concept applies both to the idea of "knowing more" above and to the socio-technical networks used to connect with others (students, teachers and other stakeholders) and data. Teachers need to help students to understand the effectiveness of such connections and even direct them on how to create and maintain the connections in such a way that it will be rewarding to their educational process.

In line with this (McAleavy, Hall, Horrocks & Rigall, 2018) are of the opinion that a good professional development package should be that which binds participants together, thereby maintains connections which keeps them constantly in touch in order to share their experiences and practices in a bid to enhance their professional development. Downs and Siemens are in unison with the researchers by positing that technology is a solid tool which teachers can use in maintaining connections between them, while striving for a meaningful professional development.

Connect Between Fields – Technology is breaking down the barriers between traditional academic fields – look at nanotechnology or neuroscience as glaring examples of how technology has transformed practices in the world. In like manner, teachers and curriculum designers need to account for the fact that these existing historic, artificial barriers between disciplines impede the natural process of connectivist learning and take steps to facilitate the further integration of historically disparate areas by actively examining the connections between subjects. Thus, teachers and curriculum designers need to find out existing relationships between academic subjects and seek strategies of establishing a link between the various fragments.

Stay Current – The connectivists are of the opinion that having up to date information about current practices is prima in the proper execution of tasks in the 21st century. Staying up to date warrants that the information user should have a workable system of communication. Up to the second access to information and the ability to incorporate that information on the fly are skills that are key to connectivist learning and should be supported by teachers through providing the kinds of authentic experiences in which they are applied. New and up to date knowledge comes from a variety of media and at the same time, a body of knowledge that has been existing of about 10 years should be meant for the trash can.

Thus, for teachers to continue exercising the teaching function, they are supposed to be up to date with their pedagogical knowledge. To update their knowledge constantly, they are to be in constant connection with their colleagues and supervisors who will share information on their professional development platforms on the most recent progress going on in the field of teaching.

Decision Making – Today’s learners are faced with the challenge of making decisions about critical issues and lack of decision making makes the life and activities of a human person to come to almost a stand still. The ability of a human person to critically examine and make intelligent decisions to resolve real life problems is another major postulation of the Connectivist theory. Besides, the current educational system of standardized curriculums and regimented progress in the educational sub sector of the economy does not allow this type of adaptive thinking. Rather, current curricular favours rote memorization and reproduction of knowledge imbibed into learners. Significant changes in the education system need to occur in order for learners to truly be able to make meaningful decisions independently in the way that they will

need to beyond the classroom setting. Game-oriented learning is one of the many ways through which these real-time decision-making abilities can be cultivated in learners.

Communities of Practice Theory

The Connectivist theory is of the opinion that teachers are to use various technologies in order to constantly stay connected and help each other get out of their ZPD, thereby accomplishing their respective professional development goals. The Community of practice theory advocates for the fact that to form such connections to enhance Teacher Professional development, the teachers are to form Communities of Practice (Lave & Wenger, 1998).

“Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do better as they interact regularly” (Lave, 1991). Thus, communities of practice are formed by individuals who engage in a process of collective learning in a common domain of human life (Lave & Wenger, 1998). It is also said to be a process of social learning process through participation in a community where people have vested interest in the learning process and thus collectively contribute ideas in order to attain the learning objectives stated by the learning community. Community of practice is a combination of experiential learning, social constructivism and connectivism theories which help to explain the complex state of learning in the twenty first century - technological age. The main idea behind the community of practice theory is that we learn in everyday life from the communities in which we find ourselves.

Many people fallaciously have the assumption that learning and education is an individualized process with a beginning and an end point and that the output of education is as a result of teaching (Wenger, 1998). The researcher debunks this mode of thinking by instigating that learning is not the sole result of teaching but also a result of cooperation with other members of the school community. Wenger holds that as we strive to survive in our social environment, we tend to form communities whose goals sometimes are based on common interest shared by members of the community. Humans thus relate and interact with different members in the communities and as they interact, they tend to voluntarily and involuntarily learn from each other. The characteristics of communities vary, some have names while others do not; some of the communities are formal while others are not (Smith, 2003; 2009). Some members of the community are brought together by participating in common activities and by what they have learnt through their mutual engagement in the group’s activities.

The community of practice theory is a concept that has evolved over time, it was first developed by Wanger and Lave in 1991 to assess learning amongst practitioners in a social environment (Li, Grimshaw, Nielsem, Judd, Coyte & Ian, 2009). The works of Lave and Wanger (1991) focused on the interrelationship between the novices and highly skilled professionals within a work setting. Their earliest works was aimed at finding out the rate at which novices gain experiences from highly skilled professionals. But over the years, there have been a considerable shift in meaning of the communities of practice concept and in 1998, it was used by the authors to focus on the participation of individuals within a group.

In the theory of community of practice, three characteristics are predominant (Lave & Wenger, 1998). These three characteristics are as follows:

The domain: A domain is shared interest that provides the encouragement and passion for members of a community of practice to come together (Lave & Wenger; 1998). A community of practice is not merely a club of friends or a network of connections between people; rather it has a specific identity defined by a common domain of interest to those who belong to the community of practice. Due to the autonomous nature of Communities of practice, the domain is agreed upon by the members as a means of ensuring that the group focuses on what is important to the members. Membership in the community of practice therefore implies a commitment to the shared domain, and therefore a shared competence that distinguishes members from other people. The domain is not necessarily something recognized as “expertise” outside the community. A youth gang may have developed all sorts of ways of dealing with their domain: surviving on the street and maintaining some kind of identity they can live with. They value their collective competence and learn from each other, even though few people outside the group may value or even recognize their expertise.

The community: A community is a group of people to whom the domain is relevant, the quality of existing relationship among the members, as well as a definition of the relationship between the inside and the outside (Wenger, 1998). Thus, the community includes the support and encouragement of all members. Individual members are proactive in educating and learning from others while strengthening the group as a whole. The community also values interactions between members and encourages members to interact with each other. Uzuner and Hayes (2014) holds the view point that for members to constitute a community of practice, the group members come

together around an idea or a given topic of interest, known as the domain on which they will constantly interact and learn from each other. In pursuing their interest in the domain, they have constituted, members are expected to engage in joint activities and discussions, help each other, and share information and ideas as a means of improving on the activities of the group. They create relationships that will enable them learn from group members; they care about their standing with each other. It is worthwhile to note that a website in itself is not a community of practice. Having the same job or the same title does not automatically create a community of practice unless members start interacting and learning together in a bid to improve on organizational practices and making one another a better professional. It is equally instrumental to note that members of a community of practice do not necessarily work together on a daily basis. The Impressionists, for instance, used to meet in cafes and studios to discuss the style of painting they were inventing together. These interactions were essential to making them a community of practice even though they often painted alone (Uzuner & Hayes; 2014). The community fosters a spirit of collaboration and oneness amongst the various members within the community of practice. Most communities of practice have no clearly stated formal design and tend to be self-organising systems. They have a natural life cycle, and come to an end when they no longer serve the particular needs of the community for which it was formed (Bates; 2019).

The practice: Practice refers to “the body of knowledge, methods, tools, stories, cases, documents, which members share and develop together” (Wenger, 1998). A community of practice is not merely a community of interest—people who like certain kinds of movies, for instance. Members of a community of practice are practitioners in a specific domain. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems and in short a shared practice that exist in their given domain of practice. This takes time and sustained interaction between the various members of the community of practice. The development of a common practice may be more or less self-conscious. For instance, teachers who meet regularly for lunch in a school canteen may not realize that their lunch discussions are one of their main sources of knowledge about how to handle students with various learning challenges. Still, in the course of all these conversations, they have developed a set of stories and cases that have become a shared repertoire for their practice. As much as some communities of practice meet regularly during lunch, others meet primarily on various social media networks connected to the internet and share best practices and experiences in dealing with day to day

work challenges (Wenger and Synider; 2000). These researchers further opine that some communities of practice may not have a precise well spelt out agenda of activities to be carried out for a given period of time, but most often share their ideas in a free - flowing, creative ways that foster new approaches to problem resolution. Individual members of a community of practice can help other members become well-rounded and improve the skills and knowledge of the group as a whole. The contribution and collaboration of the whole group helps fill the knowledge and skill gaps of individual members. This can form a collective group of members who maximize their potential and skills in a particular industry. As a community, solving problems and overcoming challenges is easier because members can rely on other members to gather the resources they need to solve problems. Multiple Community members can help groups identify professional difficulties and inefficiencies and develop strategies to improve them. Members of a community are likely to have different strengths and weaknesses that allow them to combine their collective strengths to solve problems. Besides, a community of practice model can improve the speed and efficiency of training new members. Especially when using this concept in a business or educational model, communities of practice provide new team members with the resources and network connections they need to succeed. The community can also discuss specific resources they need. Be it through the internet technology or through Human Resource teams to help make decisions about new hires.

For communities of practice to be possible, there is a need for a variety of tools to be put into place and exploited to facilitate exchange of ideas between members of the community (Wenger; 2014). The technological tools used for communities of practice are mostly the existing social media platforms on which different professional log on in order to share their experiences and adopt best practices.

Designing effective communities of practice

Bates (2019) stipulates that Wenger, McDermott and Snyder (2002) have identified seven key design principles for creating effective and self-sustaining communities of practice, related specifically to the management of the community, although the ultimate success of a community of practice will be determined by the activities of the members of the community themselves. McDermott and Snyder (2002) suggest that instructional designers of a community of practice need to:

1. Design for evolution

Ensure that the community can evolve and shift in focus to meet the interests of the participants without moving too far from the common domain of interest. Wenger, McDermott and Snyder (2002) are thus suggesting that in designing an effective community of practice, the designer should try within all means possible to ensure that the design meets the common interest of the members of the community of practice. Thus, before the designer commences with the design process, he/she must be aware of the common interest of the community in order to integrate the common ground into the design, without which, the platform will not serve the purpose for which it is intended. However, the number of participants should not also be too big to manage. Group size is determined by balancing. The designer needs enough people to create the desired peer interactions, but also need the number of people who can be managed properly as a group. If the group is too small, the CoP might miss the diversity of backgrounds and perspectives that the necessary number of people brings, and small group may not be able to generate wide variety of ideas. Basal (2015) holds that diverse group of people makes the ideas and solutions discussed in the community broader and more meaningful. Diversity has different meanings depending on the topic. For example, members from different locations can introduce different cultural perspectives on a topic. Diversity can also lead to discussion and exchange of ideas. The larger the community, the less external motivation it needs. A group of not less than 20 might work well, but only if there is enough extrinsic or intrinsic motivation to keep such a small group engaged. Generally, groups of about 100 people work best for most CoPs.

2. Open a dialogue between inside and outside perspectives

Encourage the introduction and discussion of new perspectives that come or are brought in from outside the community of practice. Wenger, McDermott and Snyder (2002) are calling for flexibility of ideas within the community of practice. Inasmuch as a community of practice is based on a common idea, members should be flexible and open enough to listen to and discuss new ideas that come up within the group. Think of the community of practice as having two audiences.

Basal (2015) posits that wider audience (all professionals) and highly engaged individuals (primary audience) and other engaged members are essential to motivate and build a sense of community early in the process. They act as moderators for all knowledge and resources. This

particular audience has specific needs, so it's important to make sure they get some benefit from their interaction with the community. Likewise, there is need to ensure that a wider audience can continue to engage with the primary audience. One way to establish this habit is to encourage interaction within the members' workflows. Thus, in building a Community of Practice, think about who the audience is and how they will come together. Groups will generally be more successful if they make it a habit to post and participate in the community and can incorporate that into their members' normal workflow, without members having to leave their duty posts to engage in activities of the Community of Practice.

Inasmuch as there is need for dialogue between the members of the Cop, great care should also be taken to ensure that the group discussion is relevant to the construction of participants' professional knowledge. A community of practice should focus on specific topics that motivate its members. If the topic is too broad, members may not know how to contribute. A broad focused topic can also make it difficult to produce measurable and meaningful results. A good indicator is the number of practitioners a topic might attract. It is for this reason that Bruns, Costa and Cunha (2018) are of the opinion that if it's relevant to thousands of users, it should probably be narrowed down. A community dedicated to ways to increase engagement at work can have too many members. Therefore, the topics of discussion in CoPs should be narrowed down in order to increase participation. Note, however, that the domain should be specific enough so that the community can focus on building actionable knowledge.

3. Encourage and accept different levels of participation

Different levels of participation should be accepted and encouraged from the 'core' (most active members), from those who participate regularly but do not take a leading role in active contributions, and from those (likely the majority) who are on the periphery of the community but may become more active participants if the activities or discussions start to engage them more fully. Thus the group members should endeavour to engage everyone in the discussions of the group. Those who are less active in the group must be encouraged by fellow participants to contribute their own ideas in the overall success of the group. Developing community members who share common goals helps encourage and motivate individual community members. This helps the group achieve more as a community. This can lead to brainstorming sessions where

members are encouraged to be creative, introspective, and identify areas they would like to improve.

Develop both public and private community spaces

Before deciding which technology to use for a community of practice, Anwar (2017) holds that the designer need to understand how its members prefer to communicate. In this light, the designer has to find out if the groups of professionals already have common discussion forum such as chats and forum where contents will be shared. It is also essential to find out if the existing technology can accomplish the objectives of the Community of Practice or there is need to have another forum which will meet the demands of the Community. This tool can be just a chat group, a wiki, or a physical room. In order to increase the commitment of learners, a learning management system "LMS" can be developed to meet the exigences of the CoP. This is however the best option because it provides a forum where members can communicate with each other and sharing content such as PDFs, spreadsheets and resources with other members of the Community. Communities of practice are strengthened if they encourage individual or group activities that are more personal or private as well as the more public general discussions; for instance, individuals may decide to blog about their activities, or a small group in an online community that live or work close together may also decide to meet informally on a face-to-face basis. Wenger, McDermott and Snyder (2002) are still insisting on the need for flexibility by advocating for the fact that community of practice members should have the liberty to form sub groups within the community and discuss other private issues concerning the parent community. They suggest that these sub groups might be online or in a face-to-face mode. However the case, there should be liberty to members to have private discussions out of the main group.

Focus on value

Attempts should be made explicitly to identify, through feedback and discussion, the contributions that the community most values. Values are a set of moral codes which an individual or a community seeks to uphold (Blackman; 2018) each community has its sets of values which it stands for. These values are many and varied as stipulated by Mercer (2019). These community values include honesty, responsibility, equality, honour, authenticity, decency, respect, trust and fairness (Mercer, 2019). These social values are values which reflect how individuals relate in a society. Thus each community of practice must identify its set of

social values which it cherishes so much and communicate them to the group participants. In this way, all participants carry out group activities bearing in mind the overall values of the group because when an organization use values to make decision, it makes deliberate choice to focus on what is important to the organization (Mercer;2019)

Combine familiarity and excitement

Familiarity and excitement are combined by focusing both on shared, common concerns and perspectives, but also by introducing radical or challenging perspectives for discussion or action. This calls for the idea that a community of practice should not have very strictly serious face. It should be a community in which people are free to express themselves with one another, a place where people are excited to go to and familiarize with other members while contributing ideas to build the overall goals of the community. Wenger, McDermott and Snyder (2002) suggest that when the community appears to be too serious, it creates tension and as such members are neither excited to participate in the discussions of the group nor are free to familiarize with group members in the idea exchange process.

Create a rhythm for the community

There needs to be a regular schedule of activities or focal points that bring participants together on a regular basis, within the constraints of participants' time and interests. Though some communities of practice may not have clearly spelt out agenda of activities as the structure of some of these communities appear to be informal (Wenger & Sunyder, 2000) but Wenger, McDermott and Snyder (2002) are of the opinion that communities of practice should have a regular schedule with focal points which can prompt the community to come together on regular basis based on the interest and availability of the participants. When the community meets on regular bases, the ideals of the community are kept alive and members strive to meet the demands of the group.

Subsequent research has identified a number of critical factors that influence the effectiveness of participants in communities of practice, these include:

Awareness of social presence

Social presence is defined as the awareness of others in an interaction combined with an appreciation of the interpersonal aspects of that interaction. Individuals within the community of

practice need to feel comfortable in engaging socially with other professionals or ‘experts’ in the domain of focus. On the other hand, those with greater knowledge must be willing to share their ideas and experiences in a collegial manner that respects the views and knowledge of other group participants. Thus, the experts are called upon to avoid the temptation of looking down on the less experienced members within the community. In a like manner, the less experienced members must learn how to cope with the experts without having an inferior feeling or being at a less significant stand point in the community.

Motivate Members to share information for the common good of the community

Participants should be encouraged to share ideas and knowledge for the common good of the community. This is based on the ideal that knowledge shared is knowledge gained, besides, the main reason for the existence of the community of practice is to share information, ideas and practices between members for the growth of the entire group.

Able and Willing to Collaborate

The members of the community should be willing and able to collaborate with each other in order to meet the goals of the community. When rules and values of the group are laid, the group members should strive to obey the demands. Besides, when tasks are shared, they various members in the community of practice are expected to work hard in order to perform the tasks assigned to them.

EDUCAUSE has systematically developed a step-by-step guide for designing and cultivating communities of practice in higher education (Cambridge, Kaplan & Suter, 2005). The steps are as follows:

Inquire: Through a process of exploration and inquiry, identify the audience, purpose, goals, and vision for the community. This stage is likened to the needs/situational analyses stage in curriculum development, where the community of practice designer is expected to carry out detailed needs/situational analyses in order to identify the audience, their needs and to state the goals of the curriculum as well as to identify factors that might positively and/or negatively affect the implementation of the curriculum (Noe, 2016). It has been recommended that one of the best ways of carrying out situational/needs analyses is to use the SWOT analyses in which the curriculum/community of practice designer finds out the strengths, weaknesses, opportunities and

threats of the program being designed (Klinghammer, 1997). On the other hand, Noe (2016) is of the opinion that the methods used in collecting data for needs analysis are consultations, study analysis, observations, surveys and reviews. The researcher goes further to postulate that the following factors must be taken into consideration when collecting information for needs analysis; the society, the teachers, the learners, the curriculum itself as well as the institutions which will be in charge of rolling out the curriculum. Kaur (2017) on the other hand adheres to this idea by positing that situational analysis is a comprehensive process and which involves the dimensions of the students, the teachers, the environment, resources, infrastructure and the social climate and setting. The researcher further posits that lack of an appropriate situational analysis is likely to have an adverse toll on the attainment of the curriculum goals.

Thus, in carrying out situational analysis with the aim of developing a model to enhance teacher professional development, the designer should ensure that the teachers' ideas as far as their ease of use of the platform is concerned as advocated by Davis (1989) are taken into consideration.

Design: Define the activities, technologies, group processes, and roles that will support the community's goals. After a careful inquiry, the next step is to design the curriculum. Here the designer is expected to state measurable objectives with the use of verbs. The objectives stated should be that which will contribute in bringing about the usefulness of the platform. In line with this, Davis (1989) posits that if teachers perceive that the platform is of importance in actually enhancing their professional development, they will make efforts to accept the use of the platform, the perceived usefulness of the platform will absolutely span from the effectiveness of the objectives stated. After the creation of the objectives, the designer is expected to design the content that will help in attaining the objectives that have been stated. In designing the content, the designer has to be sure of the mode of delivery of the content. If the content shall be web based or delivered on a face-to-face mode. The content is the sequenced and the delivery methods and materials are equally designed to meet the needs of the learners. Care should be taken in ensuring that the design content, methods and materials addresses the needs and aspirations of the learners, without which the designed curriculum might not meet the needs of the learners.

Prototype: Pilot the community with a selected group of key stakeholders to gain commitment, test assumptions, refines the strategy, and establishes a success story. After designing the curriculum, the designer is expected to trial test it on sampled schools. This is done with the aim

of identifying the strengths and weaknesses of the designed curriculum in order made amends in areas where weaknesses have been identified. In this process, teachers are at the fore front who play the role of giving feedbacks to the designers on the strengths and weaknesses identified in the course of implementing the trial version of the newly designed curriculum.

Launch: Roll out the community to a broader audience over a period of time in ways that engage newcomers and deliver immediate benefits. Here the designed program is the implemented to the entire group for which it was designed for. The audience participate the designed activities, learn the designed content, interact on the designed platform and gain the knowledge which was intended for the process. The launch or implementation stage takes a stated duration in accordance to the sequences that were previewed at the design stage. At this stage, teachers and learners are at the fore front of the entire process. As they regularly interact with the contents, methods and materials that have been designed to suit the needs of the learning scenario.

Grow: Engage members in collaborative learning and knowledge sharing activities, group projects, and networking events that meet individual, group, and organizational goals while creating an increasing cycle of participation and contribution. At this stage, the designer is expected to engage the community members in various forms of focused discussions which will enable the various participants to share their ideas, beliefs and experiences in order to enable other to learn from them. This permits the group members to learn from each other and grow.

Sustain: Cultivate and assess the knowledge and “products” created by the community to inform new strategies, goals, activities, roles, technologies, and business models for the future. This stage is likened to the evaluation stage of curriculum development where the designer is expected to evaluate the output of the curriculum in order to identify existing strengths and weaknesses with the aim of carrying out innovations and revisions in order to enable the program attain the goals for which it has been created.

Lastly, research on other related sectors, such as collaborative learning or Massive Open Online Courses (MOOCs), can inform the design and development of communities of practice. For instance, communities of practice need to balance between structure and chaos: too much structure and many participants are likely to feel constrained in what they need to discuss; too little structure and participants can quickly lose interest or become overwhelmed.

Many of the other findings about group and online behaviour, such as the need to respect others, observing online etiquette, and preventing certain individuals from dominating the discussion, are all likely to apply. However, because many communities of practice are by definition self-regulating, establishing rules of conduct and even more so enforcing them is really a responsibility of the participants themselves.

Technology Acceptance Model (Davis, 1986)

The theories of connectivism and Communities of Practice stand for the fact that teachers can use various technology enhanced learning platforms to maintain connections and foster their professional development. With this in mind, (Sandybayev, 2020) hold the view that educators are usually challenged to incorporate technology into the modern classroom in order to maintain such connections propounded by connectivism and communities of practice. Similarly, Mungania and Reio (2005) as well as Kamel (2004) push the argument further by positing that many teachers, especially females have a phobia in using technology in the educational process. Such phobia according to the researchers always lead to resistance in the use of technology in the educational process. As a follow up, McLintosh, (2010) posits that this resistance stems from the fact that some teachers view the use of technology as being too demanding in terms of cost, time and energy. To fill this gap, the Technology Acceptance Model suggests essential steps concepts to be applied in order to get teachers and supervisors accept the use of technology in enhancing teachers' professional development.

According to TAM, technology acceptance is a three-step process, in which external factors (features of system design) provoke cognitive responses (perceived ease of use and perceived usefulness), which in turn lead to emotional responses which are attitudes towards technology use/intent and affects use behaviour (Davis, 1989; Davis, 1993). TAM represents perceived ease of use, perceived usefulness, and consequent behavior predicted by behavioral intentions (Figure 1). Perceived ease of use and perceived usefulness reflect expectations of positive behavioral outcomes and beliefs that the behavior is not labor intensive (Davis, 1989). Follow-up research has shown that the intention of an action can be translated into an attitude towards that action (Davis, 1993), which is an emotional appraisal of the action's possible consequences (Ajzen, 2011). The higher the emotional response, the more likely the behavior will occur. The impact of

perceived usefulness on actual usage can be direct, highlighting the importance of variables in predicting behavior. Perceived usability does not directly affect usage behavior, but it does support the perceived usefulness effect (Davis, 1993). This model suggests that applications are more likely to be expected to be easier to use, more likely to be seen as useful to users, and more likely to promote technology adoption (Davis, 1989). Davis, 1993).

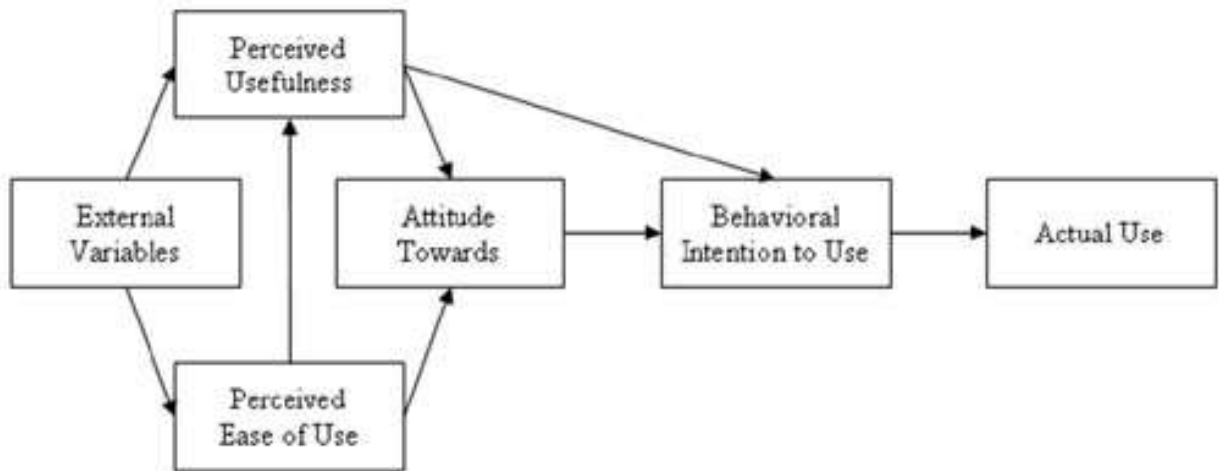
The means for model development and technology acceptance have made important theoretical contributions and brought great practical value. Application of the IS usability testing model has made it possible to assess user motivations for adopting various technologies, which has not been done before (Hwang, 2005; Gefen, Karahanna & Straub, 2003; Araújo & Casais 2020). This is due to the lack of validated subjective measurements. The development of constructs that show strong and significant associations with usage behavior has made it possible to understand the cognitive and affective factors that mediate the impact of system characteristics on acceptance of technology (Davis, 1989).

TAM, acknowledges that many people shy away from the use of technology because they perceive that the software may be too difficult to operate or may not be useful to them (Davis, 1986). It is for this reason that Davis brought forth the Technology Acceptance Model to explain why people accept or resist the use of technology in their day-to-day activities.

Besides, some teachers who are adamant to accept the use of technology in the teaching learning process even claim that it will lead to low educational output and it will act as a source of distraction to learners during the teaching/ learning process. That notwithstanding, McLintosh (2010), holds that the use of technology in the educational process has come to stay. In this line of thoughts, sociologists of education have often held the view that education, just like a living organism of the society is always in constant evolution (Ram, Poudel & John, 2019). As a follow up, education which plays the role of socializing different individuals to live in the society must constantly change to adapt to the needs of the changing society. With this view in mind, the use of technology in the teaching/ learning process is just one of such evolutions.

In order to seek strategies that educational technologies can be adopted in order to make the use of technology in the educational milieu more and more acceptable. Davis developed a Technology Acceptance Model (TAM). The original model which has six constructs notably perceived usefulness, external variables, perceived Ease of Use, Attitudes Towards, Behavioral Intention to Use and Actual Use is present in figure 6 below.

Figure 5: Technology Acceptance Model adopted from Davis (1989)



As depicted on figure 5, Davis (1989) stipulates that there are different elements of The Technology Acceptance Model (TAM). However, other researchers have had significant contributions to the Model over the years. However, the variables of the Technology Acceptance Model are as follows:

External Variables

Venkatesh and Davis, (1996) hold that External Variables include “system characteristics, training, user involvement in design, and the nature of the implementation process” Röcker (2009) suggests that external variables like individual abilities and situational constraints can indirectly influence an individual’s usage of technology in the schooling process, through the influence of perceived usefulness and perceived ease of use. Therefore, note should be taken to the fact that external variables have a direct influence on how an individual will perceive the usefulness of technology and how easy the usage of the technology will be.

For example, Venkatesh and Davis, (1996) militate for the fact that training is one of the external variables. Therefore, in a situation where teachers are actually trained to use a particular technology as well as they are involved in the design process to express their preferences, they can easily accept the technology used in enhancing their professional development, the teachers after being involved in the design process and being trained on how to use the platform will

perceive the technology as being easy to use (Kahigii, Danielson, Hansson, Ekenbery&Tusubira 2009). In the course of the planning and training phases to develop the platform, the teachers will also perceive the usefulness of the technology in enhancing their professional development which are all determinants which influence their acceptance to use a particular technology.

Alhabi and Drew (2014), Martin and Kellermanns (2004), Hubonna and Kennick (1996) hold that two ideas are prima in explaining the Technology Acceptance Model. These are perceived usefulness and perceived ease of use.

i. Perceived Ease of Use (PEU)

Davis (1993) is of the opinion that perceived Ease of Use is the degree to which an individual can use a piece of technology without much effort. Gefen and Straub (2000) describe perceived ease of use in the light of intrinsic motivation, in which learners develop a natural urge to exhibit particular behaviours. Likewise, if teachers perceive that a piece of technology is easy to use in enhancing their professional development, they will develop a natural liking for it and tend to accept it, since it requires little efforts to use is. Venkatesh and Davis (1996) postulate that teachers' perceived ease of use of technology in enhancing their professional development has a lot to do with what they call computer self-efficacy. Computer self-efficacy according to Venkatesh and Davis (1996) is self-confidence with which are able to find study materials and communicate with other teacher overs the web and the possession of necessary skills to execute the teaching task. Thus, once a teacher lacks self confidence in his ability to search materials online and communicate with other teachers on the web, he/she becomes discouraged to use technologies in learning. It is for this reason that Mungania and Reio (2005) urges e-educators to develop computer self-efficacy in users undertaking e-studies.

Therefore, acquiring knowledge on the use of technology is actually the variable that will motivate teachers to actively use technology in their respective classroom and such will provide a good foundation for new advancements and modernization of educational educator in all ramifications (Ifinedo et al., 2020). However, several variables may influence the teacher's decision-making process regarding technology integration in the classroom (Andyani et al., 2020). Many trainers feel that they need to acquire the necessary technology skills first before attempting to use technology in the practice of teaching (Falloon, 2020). Educators agree that not only do they need to be proficient with technology use, but they also need to feel comfortable using it in the presence of digital learners. Techataweewan and Prasertsin (2018) therefore

hypothesize that digital literacy is positively associated with the adoption of technology use in the classroom, both in classroom and student development (Sánchez-Cruzado et al., 2021). Thus, to ensure the acceptance of technology in the TPD process, providers of TPD programs have to first of all get themselves grounded in the use of the technology tools that can be used in the TPD process. Without adequate knowledge in the use of technology tools to facilitate TPD programs, teacher educators are liable to resist its use in the Teacher Professional Development programs. This is because they will perceive that the technologies are difficult to operate and thus resist its integration in the TPD programs. It is for this motive that Fuchs (2021) thinks that in a situation where technology has to be integrated in the teaching learning process, the top most personalities involved in the chain have to school on the use of the piece of technology. This is because the perceived ease of use will invariably impact their acceptance of the technology.

ii. Perceived Usefulness (PU)

This is “The degree to which a person believes that using a particular system would enhance job performance.” (Davis,1993). The researcher further posit that Perceived Usefulness has a direct influence learners’ behavioural intention. It is but normal that if a human being perceives an object as useless, he/she pays very little or no attention to it.

Although the use of digital technologies to enable learning anytime, anywhere, delivering content, and connecting learners is increasing (Henrie et al., 2015), it is important to achieve maximum benefit and what is considered useful. It remains a challenge to understand how over the past two decades, researchers have pointed to both positive and negative effects of students' continued engagement with technology (Rashid & Asghar, 2016). Others have found evidence that students are using a variety of technologies to access and share information and interact with teachers and peers to facilitate and enhance their learning experience (Balakrishnan & Gan, 2016). The benefits of technology include more diverse educational content, more equitable access to higher education, more efficient teaching, and more individualized learning processes (Cohen & Baruth, 2017; Cohen & Nachmias, 2006; Goodfellow & Lea, 2013; Luckin et al., 2012)). . Moreover, digital technologies will become increasingly personalized, remote, adaptive and data-driven (Johnson et al., 2012). While some believe that technology has transformed teaching and learning (Beetham & Sharpe, 2013; Kennedy & Dunn, 2018) other researchers believe that disruptive technologies pose challenges to the educational process. Some claim that they do disintegrate the students from the actual learning process at it serves as a tool for

distraction, thus purporting that the use of technology in the educational process is void of usefulness (Anderson & McGreal, 2012; Roche, 2014). Critics also argued that the use of technology could be detrimental to certain people. Characteristics such as socioeconomic status and institutional resources play important roles in students' use of technology (Chen et al., 2010). Additionally, some researchers argue that the lack of face-to-face interaction can reduce educational effectiveness (Porter et al., 2016).

Henderson et al. (2017) identified eleven (11) perceived benefits of using technology from a student's perspective. This research finding has since been corroborated by other researchers. Recognized benefits include flexibility of time and place (Chuang et al., 2018; Soffer et al., 2019), ease of organizing and managing learning tasks (Chuang et al., 2018). Once again (Shih & Tsai, 2017), an opportunity to learn in a more visual format (Güney, 2019). Theo et al. (2019) linked student perceptions to actions. They found that perceptions of the usefulness and ease of use of technology have a significant impact on actual student usage, especially LMS. Perceptions of usability were heavily influenced by the complexity and testability of the technology. Attitudes and perceived behavioural control were also important factors in student behavioral goals.

Same scenario applies to Teachers' Professional development, whereby if teachers perceive that a particular technology is of very little or no use to the attainment of their professional objectives, they pay little or no attention to it. Likewise, if various technologies are introduced to the Teachers' professional development process and teachers do not see the role the given technologies play in the attainment of their professional goals, they tend to reject them.

To prove this point, Röcker (2009) posits that even if an individual teacher has a negative attitude towards a specific technology, this could be outweighed if the teacher perceives that the technology will be of great use to his/her professional development. Therefore, in a situation where a teacher perceives that a given technology will play a significant role in his/her professional development, even if the teacher has a negative opinion about the technology, the he/she can easily dismantle his/her negative beliefs and accept to use the technology.

Gefen and Straub (2000) describe perceived usefulness of technology in fostering academic purposes in the light of extrinsic motivation, which has to do with what the learners' ability to have a reward for exhibiting a particular behaviour from the environment out of him/her. In this vein, for a learner to accept the use of a particular technology, he/she must be convinced of how

much reward that technology will be to the learning process. Once they perceive it as yielding little or no reward, they are not motivated to use the piece of technology.

iii. Attitude Towards

Ajzen (2001) defines attitude as summary evaluation of a psychological object captured in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable dislikable. In a nutshell, this is a learner's feeling and view point towards technology. A learner can have a positive or a negative attitude towards an educational technology based his/her perceived usefulness and perceived ease of use. If a user perceives that a piece of technology is easy to use and is beneficial to the task at hand, he/she will have a positive attitude towards the technology, which will foster his/her acceptance and usage of the technology therefore an individual's attitude towards the use of an innovative technology is directly determined by the concern's behavioural intention (Nkwenti 2019).

Besides, Porter (2013) postulates that an individual's attitude towards technology has been found to be linked to academic level, those in minority groups, socio - economic status, sex, and age. In her study, Porter (2013) holds that the rich, males, more educated and younger people are more likely to have a positive attitude towards the acceptance of technology than the poor, females, old and the less educated. We should recall that those with a positive attitude are more liable to accept and use technology than those with a negative attitude. This therefore points to the fact that in introducing a new technology, a lot of attention should be given to the poor, females, those who are more advanced in age and those of the minority group in a society. This is because they are the ones who can likely resist the use of a given piece of technology.

Thus, for an educational technologist to have people accepting and using technology in the teaching and learning process, he/she has to ensure that the users have a positive attitude toward the use of educational technologies. When people have a cold attitude towards the use of technology, the probability of them accepting and using it is very low. . It is for this reason that Len (2014) found out that when the effect of attitude towards learning with telephone is controlled, the relation between mobile-learning environment and teachers' professional development turn out to be insignificant.

Hence, a positive impression of technology in the classroom and its impact on student success may be naturally associated with the use of technology in the classroom (Fuchs, 2021a; Wilson et al., 2022). In this light, technology acceptance has to begin with facilitators of TPD programs. If educational supervisors perceive that technology will be useful in the TPD process, they will be quick at adopting it in the TPD process. On the contrary, if educational supervisors do not perceive technology as a useful tool in facilitating the TPD process, they will be resilient at integrating technology in the process of TPD.

Similarly, researchers think that the use of technology in the teaching/learning process also depends on the pedagogic belief of the education (Choy and Cheung, 2022). The researchers advocate that educators who prefer student-centered learning, focusing on the student rather than the teacher, may be more likely to encourage technology in the classroom that enables higher levels of self-directed learning. Additionally, other researchers posit that teachers who prefer inquiry-based learning that requires students to delve into more open-ended topics may be more willing to introduce technology into the classroom (Deák et al., 2021). This is due to the fact that, in Fuchs (2021), technology allows students to delve deeper into concepts and ideas in ways that are not possible or effective with non-digital teaching tools. Educators who employ traditional teaching and learning methods, such as content learning (or memorization) that forces students to memorize facts and details, may be less receptive to the introduction of technology in the classroom (Lewis et al. al., 2018; Willis et al., 2018). al., 2019). In this light, the acceptance of technology in the TPD process will depend on the pedagogic perception of educational supervisors or providers of TPD programs.

Thus, in integrating the use of technology in enhancing the professional development of teachers, a lot of care has to be given to teachers in the rural areas, female teachers, less educated teachers and teachers who are advanced on age. This is so because they are the ones who can likely resist the use of technology in enhancing their professional development.

Conceptual Literature

Conceptual framework is a representation of the researcher's synthesis of literature and how to explain phenomenon (Rgoniel, 2015). Conceptual framework maps out the actions required in the course of the study, given the researcher's previous knowledge of other researchers' points of view and their observation of the subject of research. Similarly, conceptual framework sets the

stage for the research to present the particular research question that drives an investigation being reported based on the problem stated at the beginning of the research process (MCGaghie et al, 2001). In line with this, in this section of this study, the researcher reviewed literature related to the main concepts of the study. These key concepts are: weaknesses of one-shot model of teacher professional development in the basic education sub sector in Cameroon and teachers' preferences in the design of teacher professional development model through the use of mobile learning and policy orientations to foster the use of mobile technology in TPD practices.

Shortcomings of One-shot Model of Teacher Professional Development

A one-shot model of teacher development involves a single individual training session or workshop. These are typically short-term programs that focus on a specific topic or skill. Training sessions are conducted by subject matter experts or therapeutic area experts. One-shot models provide a focused learning experience on a specific topic or strategy, but may not receive extensive follow-up or ongoing support. Unless the one-shot sessions are highly interactive and hands-on, there's not much to be done through this model to improve teacher performance. This is because teachers need to be able to apply their ideas to the next lesson, and reflection on results should always be encouraged. Hunzicker (2011) on the other hand emphasized the need to change the 'one-shot' models and make teacher professional development and learning part of their daily practice.

Before delving into the details of the weaknesses of the one-shot model of TPD, it is necessary to have a review of the existing models of TPD as follows:

Models of teacher professional development

One of the main challenges of educational policy makers is to provide teachers with professional development programs that are both effective and relevant to their practice of teaching (Global state of digital learning survey, 2017). In addressing these needs of the teachers, the school educational policy makers must decide on the most appropriate model for teacher professional development to use. The survey further stipulates that in choosing the model, the decision maker must ensure that the educational system has the capacity to implement and sustain the chosen model. These are the various models a decision maker can choose from.

Action Research

In enhancing their professional development, teachers can engage in action research by using their classrooms as both practitioners and theorists (Abderrahim, 2015). In doing this, educators begin by asking how current educational practice might be improved. They thus study the relevant literature and research to select an appropriate approach that might improve the present educational practice.

Teachers sometimes use their classrooms as research their research laboratories. For instance, teachers might teach a concept in different methods in order to find out which method has the greatest effect on student learning. Likewise, teachers might experiment to see what approach is most effective in facilitating cooperative learning among students. In the same vein, School Administrators can equally use action research to improve on their administrative roles in schools. This model of teacher professional development is a reflective strategy which can be used formally and informally and it requires the collection of qualitative and quantities data, which can lead to enhanced teaching practice (Mc Niff, 2010).

Teachers can successfully carry out mini-research projects in their classrooms, while school administrators on their part use the school as research laboratory.

Action research helps teachers to grow professionally and effectively realize how they are growing in their professional practice and knowledge (Abderrahim, 2015).

Book Study

Book study is an effective model of teacher professional development that educators at all levels can use to facilitate their professional growth. Book study is a model in which teachers form a small group and discuss a given topic read from a book (Taylor & Francis group, 2020). The topic read and discussed from the given book should be of interest to all members of the group. However, varying viewpoints on the topic read and discussed are important because they bring in a wide range of opinion and enliven discussions which can significantly improve on the professional development of teachers. One of the major issues on which the group members must agree on is a schedule for reading and discussion. If the book study is to consist of four to eight meetings in all, then each meeting should last between 60 and 90 minutes (Taylor and Francis group, 2020). The group members are expected to choose a book on a topic that is of interests all the group members but that is sufficiently open-ended to encourage new learning through reading and discussions. The book chosen should be that which is thought-provoking and have enough

depth to stimulate debate amongst the members of the book study group. Book study groups are important because they foster discussion and communication between teachers who discuss the theory read from a book and seek strategies of implementing the theories in the actual classroom setting. At the conclusion of the book study, participants are called upon to ask questions like: Did the book effectively stimulate meaningful thought and discussion? Did the group study meet the learning objectives earlier set for the book study group? How might the group study experience be improved upon in subsequent sessions?

Classroom/School Visitation

Teachers visit the classrooms of their colleagues in order to view innovative teaching practices in order to improve on their own personal pedagogy and classroom practices. In another instance, teachers carry out classroom visitation in order to provide meaningful feedbacks to their colleagues who will use the information to improve on their teaching practice (Halim, Wahid & Halim, 2018). Classroom visitation came as a recommendation to enhance teacher professional development (Borko, 2004). For classroom visitations to occur, the school administrator must be willing to engage teachers in the entire process. Classroom and school visitations may range from a single day up to two weeks and/or multiple visits over time.

Collaborative Curriculum Development

When teachers part take in the curriculum design process, it helps them to develop and insight of how the curriculum is constructed and gives them ideas of implementing the curriculum effectively (Handelzalts, 2009). Collaborative curriculum development provides a unique opportunity for teachers to delve deeply into their subject matter. This thus calls for the development of curriculum using the bottom – top approach, where the teachers are collaborating at the centre of the curriculum design process, working hand in glove with educational hierarchies. Working together, these teachers can design new planning materials, teaching methods, resource materials and assessment tools. A situation which gives them a better mastery of the curriculum document and invariably positively affects the curriculum implementation process.

Conference Audio Tapes

Conference audio tapes provide teachers who were unable to attend a professional development session with an opportunity to learn new ideas from experts. Most organizations and teacher associations make available information on sessions or proceedings through audio cassettes, CD-ROMs, and MP3s. This gives an opportunity for the teachers who could not attend the training session to listen and learn from the audio tapes.

Educational Seminars and Workshops

Teacher professional development seminars and workshops organized by educationists can provide professional development opportunities and particularly when they have been made as part of teachers' professional development plan. Tingley (2020) holds that education seminars and workshops help teachers to learn about the latest innovations in their fields as well as to get meet other professionals out of their schools of practice. During seminars and workshops, teachers meet with other experienced educationists who will give talks on selected themes. After each talk, there are interactions between the participants and the facilitator, a situation which enable teachers to learn new innovations in their respective fields of teaching.

Curriculum Mapping

Curriculum maps are tools used in organizing teaching. Curriculum maps outline a sequence for delivering content and provide a clear scope for what must be taught to all students as specified in the official school curriculum. Curriculum maps can be aligned both horizontally and vertically, organize lesson contents, assessments, skills, and resources over a specified period of time. A curriculum map can also serve as a tool for collecting data about the implemented curriculum in a school and in a region. According to Burn (2001) curriculum mapping provides a process through which teachers can become active participants in improving teaching and learning as it builds their strength and creativity in the teaching process. By mapping what's actually taught and when and aligning it with assessment data, teachers can modify instruction to suit the map that has been prepared (*Educational Leadership*, December 2003/January 2004).

Focused Conversations

Focused conversation is a sequential four-stage process that can help teachers reflect together about an issue related to the teaching-learning process be it large or small. A facilitator leads the

conversation by asking a series of questions that elicit responses from participants. The questions and answers take the group from the surface of a topic to its in-depth implications, opening up teachers' minds to learn from the topic under discussion. The four stages of focused discussions as presented by Stanfield (2017) are as follows: the objective level whereby questions about facts and external realities are asked; the reflective level during which questions about feelings and hidden images are asked; the interpretative level whereby questions on significance, insights and implications are asked and finally the decision level where questions about resolutions and projections are made. Such activities during focused conversations help the teachers to develop their professional competences.

Mentoring and Tutoring

Mentoring and tutorship is a model of teacher professional development whereby newly recruited teachers from teacher training colleges are placed under the guidance of more experienced teachers (Yelena, 2017). Mentorship is also said to be a process in which a more experienced professional shares his experiences and practice, provide support and guidance for a novice professional (Geeraerts et al, 2014; Long, 1997; Salleh & Tan, 2013). Thus, Mentoring is a confidential process of teacher professional development through which an experienced teacher professional provides another with information, support, feedback and assistance for the purpose of refining present teaching skills, developing new ones and enhancing problem solving and decision making in a way that promotes professional development. Though a traditional model of enhancing teacher professional development, it is very effective in enabling beginning teachers to quickly become a professional (Ganser, 2000; Hudson, 2013). Studies on beginning teachers have proven that the first three years of teaching play a crucial role in shaping a teacher's perception of the teaching profession and in helping the beginning teacher decide whether to stay or leave the profession. Beginning teachers are in greatest need of the support that will enhance their classroom management and teaching skills. They also need a strong support system that will help them see teaching as a collegial, rather than an isolated, endeavour. Mentors can provide the advice, suggestions and constructive feedback that can make the difference between whether a new teacher succeeds or fails There exists both group mentoring and one-on-one mentoring in which the more experienced teacher works with a group of novice teachers and on individual bases respectively (Salleh & Tan, 2013). Both forms of mentoring and tutoring promotes

collaboration and interaction between the experienced and novice teachers, thereby bringing about improvement of teaching practice on the part of the novice teacher(s).

Journaling

Journaling is a technique for recording observations and reflections which are capable of enhancing the professional development of teachers. The entries of journals may be related to teaching, student growth, implementation of a new educational initiative or any subject for which a teacher may want to develop a record. The journal can provide a rich, qualitative record of unfolding events in the fields of teaching. Thus, teachers can read such journals of the experiences of other professionals as a means of improving their practice.

Lesson Study

Lesson study is a professional development process that principally teachers of Japanese origin engage in, in order to systematically examine and improve their practice of teaching. In this process, teachers work collaboratively to plan, teach, observe and critique a small number of study lessons. To provide focus and direction to lesson, teachers select an overarching goal and related research question that they want to explore. This research question guides their work throughout the lesson study. Teachers then jointly draw up a detailed plan for the lesson that one of the teachers have delivered to learners in a real classroom setting. Other group members then observe the lesson. The group then meets to discuss on the lesson and give their observations based on the research question earlier stated. The group often revises the lesson, and a different teacher delivers it in a second classroom, while group members again look on and take down notes based on the their research questions. The group then meets again for the second time to discuss the observed instructions made during the first lesson. Finally, the teachers produce a report of what their study lessons have taught them, particularly with respect to their research question.

Networks

An effective teacher professional development initiative uses a variety of digital communication networks and strategies. The vertical and horizontal boundaries at the school and system level must become interrelated and mutually supportive to teachers. Electronic networks like whatsapp, tweeter and blogs can effectively respond to teachers' needs to communicate with a larger and

more diverse group of educators beyond the staff at their own schools. Just a computer, a modem and an access to a telephone line can link teachers to the electronic village. Open educational systems can connect teachers to existing online libraries, databases, list servers and other communication systems. On such communication platforms, participants are able to discuss such issues as evaluation and assessment, technology across the curriculum, environmental and global education, second language instruction, conflict resolution, school leadership and school-based research and a host of others. These enable the teachers to share ideas and grow in their teaching profession.

Online Professional Development Programs

Some organizations and educational institutions have developed online courses, tutorials and self-guided programs for teacher professional development. Most programs have a registration fee. The programs are developed to enable teachers to stay at their place of work and study by proxy in order to enhance their professional development.

Peer Coaching

Bakar (2020) is of the opinion that peer coaching is a model of teacher professional development in which two teacher professionals agree to work together by reflecting on current practices, expand, refine and build new skills in teaching. Discussions allow teachers to develop ideas that can be integrated into their evolving personal pedagogy and professional practice. The researcher holds that the appellation of this concept has changed over the years to be referred to as peer support or peer collaboration because the term “coaching” signifies that one of the teachers is more experienced than the other. Peer coaching does not only need two colleagues working together, it can span up to five colleagues coaching one other in the practice of teaching. Peer coaching can take different forms and stages. Besides, Roleau (2019) is of the opinion that though teachers can co-coach one another, they can equally seek the services of a more experienced teacher to engage them in the coaching process.

In peer coaching there is usually a pre conference during which the participants agree on what to observe, the type of data to be collected, guidelines of the behaviour of the coach, date and time of the observation and the principles to be followed; the observation stage during which one of the teachers presents a lesson and the post conference stage during which an evaluation and

critique of the lesson is done. Lee (1991) suggests that another approach of peer coaching is by sharing stories and narrations related to the practice of teaching during coaching sessions.

Thus during peer coaching, teachers interact with their colleagues in order to make teaching plans, execute them and get feedbacks which are used in improving their professional development (Ma, Xin & Du, 2018). These researchers hold that such a practice enable teachers to reflect on their practice, answer relevant questions and develop in-depth knowledge and practice of the teaching profession. It equally enables teachers to face teaching with a higher level of self confidence and to approach the teaching profession with a collaborative spirit.

Professional Development Schools

According to Hunzicker (2018) Professional Development Schools (PDS) are schools that collaborate with a university to support teacher preparation, professional development, inquiry and research and student learning. The faculty and staff of the university work directly with field-based educational practitioners on problems and issues relevant to the everyday practices of teachers, schools and school systems. Universities play an active role in graduate education and professional development certification.

Through their ongoing communication with teachers, principals, consultants and superintendents, faculty members help to identify trends and challenges related to the teaching field. Field development projects are collaboratively formulated between school administrators and university personnel and may involve a combination of the following activities: problem framing, planning, and delivery of Professional Development sessions, ongoing school support, board committee membership and project evaluation.

Professional Organizations

Many organizations offer publications and professional development programs for teachers, among them are Cameroon English Language and Literature Teachers Association (CAMELTA), Teacher Association of Cameroon (TAC) and Teacher Resource Centers situated in every region of the republic of Cameroon. Similar associations in the Diaspora are the Association for Supervision and Curriculum Development (ASCD), Phi Delta Kappa, the National Staff Development Council (NSDC), the National Association of Elementary School Principals (NAESP) and the National Association of Secondary School Principals (NASSP). These

associations offer support to teachers in enhancing their professional knowledge in the practice of teaching. Some teachers turn back to the members of their association when faced with a professional difficulty.

Professional Portfolios

Professional portfolios are collections of credentials, artifacts and reflections that document a teacher's own professional practice (Wolf, 1996). Basically, teaching portfolio is a collection of information of a teacher's own practice in the field of teaching. A portfolio contains information like lesson plans, student assignments, videos of lesson taught, just to name a few. When such records are collected and kept, it enables teachers to effectively assess the quality of their teaching and gives them an opportunity for self reflection and collegial interactions using document episodes of their own teaching. Some teachers and school administrators have used the portfolio development process to reflect on and improve their professional practice.

School Improvement Teams

This provides various members of the school staff with the opportunity to address contextual school issues using a process of strategic planning and action research. Effective strategic planning empowers all members of the school community like school administrators, teachers, other school paraprofessionals, support staff, parents, trustees and other stakeholders—by helping them to build their future exactly as they want it at the professional and personal levels. The strategic planning process as well involves the school staff reaching a consensus on the expectations they envisage for the school as a whole. The effectiveness of strategic planning depends entirely on the extent to which the school administration and other staff members are willing to improve and to invest the time required to bring about that improvement in the quality of services offered in the school.

Self-Reflection

Self-reflection is a critical skill for the ongoing development of one's professional practice (Marvel, 2018). It is a model in which teachers engage into reflection in order to negotiate challenges and engage in solving problems faced during the teaching learning transaction (Hidiyati, 2018). Farell (2012) intimates that findings of the reflection act does not just emerge from impulsive or intuitive feelings, rather it needs the systematic collection of data about

teacher's works and make decisions based on the information collected. Many teachers use three levels of reflection to improve their professional development: reflection on action, reflection for action and reflection in action. Effective self-reflection as a strategy of improving teachers' professional development can be broken down into the following four steps: (1) *problem identification*, during which consists of teachers identifying a significant problem or question about their practice and which they are bent on seeking solutions for; (2) *information gathering*, during which teachers collect relevant data to inform the area of the practice of teaching; (3) *reflection and decision-making*, during which teachers seek to find meaning in the data through reflection and systematic analysis; and (4) *application and change*, during which the teachers make plans on how to improve their practice. Self-reflection can be combined with other PD strategies such as action research, journalling and developing a professional portfolio especially by teachers who are in their first year of teaching (Farell, 2012).

Training Trainers/Lead Teachers

Some of the roles of a teacher trainer is to help a group of teachers identify a project that is meaningful to them and then identify and implement the steps required to carry it out: implementing curriculum, conducting research, holding workshops and establishing new lines of communication among school staff. By engaging in such activities, the teacher trainer can facilitate vision building and conflict resolution amongst staff, a process which can facilitate the professional development of teachers. Besides, it is worth noting that the persistent presence of a teacher trainer in the professional lives of teachers permits the trainer to constantly remind the teachers of various practices when faced with given lessons. Teacher trainer model of TPD is a way for teachers and administrators to develop and hone their collaboration and skills of the practice of teaching.

Video Conferencing

This is a model of TPD which permits live exchange between teachers and conference facilitators who are found in different locations but connected on the internet with the use of a web camera (Drexhage, Leiss, Schimdt & Ehmke, 2016) Annetta and Dickerson (2006) hold that most TPD programs take place in urban centres, teachers in the rural areas are usually left out of the training opportunities. The researchers then propose video conferencing as a model through which teachers in the rural areas can equally get involved in the training sessions. The ideas of the

researchers sound good but such a situation is very difficult to suit the contexts in sub-Saharan African countries like Cameroon. This is based on the fact that in most of the sub-Saharan African Countries, internet connection most often are limited to the urban areas while most rural areas do not have access to the internet. Besides many teachers are not versed with the use of technologies in the teaching/learning process, but continuous involvement of the teachers in the use of technologies can improve the situation (Annetta and Dickerson, 2006). However, the case may be, the use of video conferencing is an effective model of enhancing TPD. Video conferencing enables teachers to consult with their peers when distance would otherwise prevent them from doing so. Video conferencing can be used to facilitate study groups, analyze student work, participate in workshops and view presentations.

Viewing Educational Videos

Gaudin and Chalie (2015) purport that the use of educational videos have become a significant element of teacher training which have brought about heightened teacher motivation, optimal cognition and improved classroom practice. There are wide selections of professional development videos online and in some school libraries that teachers can access and watch. Most of the educational videos are accompanied by a facilitator's manual and workshop material that group leaders and even individual teachers can use to acquire professional development at a time that is convenient to them.

Classification of Teacher Professional Development Models

Besides the TPD models presented above, Mohan, Lingam & Chand (2017) opine that the model chosen by a set of teachers depends on their view points and beliefs of how teachers who are adult can effectively learn new skills. To the researchers, PD models can be largely classified into two broad categories as follows:

Traditional PD Model Traditional models

Traditional TPD Models have been described as being teacher-centred. Girvan, Conneely and Tangney (2016) have argued that traditional PD is the transmission of information related to professional by an expert. The researchers further stipulate that the focus is on the transfer of information as an individual process to bring the immediate change in the improvement of teachers' professional practice. But research has shown that in reality, the information transmitted

through the traditional models do not really help teachers much in enhancing their professional development (Bausmith & Barry, 2011; Guskey, 2002). It is thus regarded as ineffective practice. Apple (2009) suggests that top-down teacher PD models in schools often align with hierarchical structures that de-skill teachers from their intellectual work by treating them as passive receivers of mandates from hierarchies. In addition, Kennedy (2016) argued that traditional PD initiatives are never really designed based on how teachers learn but are instead designed on the assumptions that highly effective teaching is as a consequence of mastering a set of technical skills. Therefore, the traditional models TPD have also failed to respect the agency and professional development learning needs of classroom teachers (Trust, Krutka, & Carpenter, 2016). This was further affirmed by Darling-Hammond, Wei, Andree, Richardson and Orphanos (2009) who purported that many teachers believe that the Teacher Professional Development models available to them are not very effective or does not meet their desired professional needs. Traditional PD models are characterised by narrow minded aims that are disconnected from broad and complex learning needs of teachers (Opfer & Pedder, 2011). Traditional models of TPD often includes include sub models like short workshops or seminars that usually take place outside the school of practice of the teachers (Trust, Krutka, & Carpenter, 2016). Kennedy (2016) believes that even though such seminars and workshops are capable of introducing teachers to essential knowledge and skills, the knowledge and skills acquired often lack depth and tends to focus much more on content knowledge. Contradictory, researchers have proven that quality TPD experiences are be centered on the improvement of teaching and student learning whose process should be long-term, ongoing, social, constructivist, and job-embedded (Desimone, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Timperly & Alton-Lee, 2008).

Job-Embedded Models of Teacher Professional Development

The job-embedded models of TPD are based on teachers' day-to-day teaching practice with the intent of improving student learning (Darling-Hammond & McLaughlin, 1995; Hirsh, 2009). Hunzicker (2010) advocated that to have a meaningful TPD model, the models is expected to be rooted in the professional practice of the teachers. To teachers, a relevant professional development model is that which is linked to their daily experiences in the classroom (Flores, 2005; Tate, 2009). TPD which takes place within the school setting promotes active learning and

bring about consistency more than professional development activities that take place in traditional learning sites (Quick, Holtzman, & Chaney, 2009), and are hence regarded as being more effective. Darling-Hammond et al. (2009) identifies the following twelve models to be job-embedded models of TPD: action research, examining student work, lesson study, assessment development teams, case discussions, study groups, critical friends' group, implementing individual learning plans, mentoring, portfolios, professional learning communities and coaching.

Away from the classification of TPD models, Croft, Coggshall, Dolan, Powers and Killion, (2010) suggest that the format of professional learning adopted for the training of teachers does not really matter as long as it is grounded on theoretical knowledge which is relevant, self-directed and significant in helping the teachers improve on their professional practice and improving students' learning. Similarly, providing teachers with openings to participate in collaboration and reciprocal learning that is initiated from the ground to the top, as opposed to being instigated from the top down, encourages and enables teachers to embrace learning opportunities, engage with colleagues to share ideas, brain storm and collaboratively learn (Borko, 2004). Thus, the TPD models in schools are expected to be highly embedded in the works of teachers (Doornbos, Bolhuis, & Simons, 2004; Pyhalto, Pietarinen, & Soini, 2015), as it is continuous and connected. Mansvelder-Longayroux, Beijaard and Verloop (2007) are of the opinion that in-service teachers usually learn from their colleagues by experimenting ideas and reflection.

From the forgoing, one-shot models of TPD are those which occur during short sessions without follow ups to ensure implementation of the previous sessions. It usually take place in the form of seminars and workshops as with the classroom, the purpose of the workshop is to impart what has been learned in teacher professional development activities in the real classroom situations. It always involve practices such as ice-breaking activities, demonstrations, PowerPoint lectures, readings, modeling, discussions, videos, writing on chart paper and so on workshops are usually held in central (capital) facilities with relatively good infrastructure and facilities (air conditioning, internet, stable power supply). This sequence of events can occur several times a year (if the project has sufficient funding), once a year (if not), or once a year (if the funding situation is very bad). The workshop or seminar may last for a day, several days, or even a week,

but usually ends with encouragement, promises and the best of intentions to return to school and put into practice what has learned.

The one – shot workshop model of teacher professional development has been characterized as being ineffective in enhancing the professional development of teachers (Summey, 2013; Koellner & Greenblatt, 2018; Crescente & Lee, 2011, Guskey, 2002). Despite such shortcomings, the essence of teachers’ professional development (TPD) irrespective of the model used, has been universally acclaimed in the past few decades now and it is seen as contributing greatly to the improvement of educational settings and educational change (Hattie, 2009; Guskey, 2003). In addition, research works have consistently proven that if the right model of Teacher Professional Development is used, it can significantly lead to improvement in teachers’ practices and self-efficacy (Gilles, Davis, & McGlamery, 2009; Borko, 2004.) Despite these benefits, recent empirical research studies have proven that the transfer of professional development to the workplace was difficult because the right model is usually not used and that TPD interventions often had limited success with regard to the improvement of teachers’ practice of teaching, especially in the longer term (Timperley & Alton-Lee, 2008; Desimone, 2009). Several studies have indicated that, besides the features of the Teacher Professional Development intervention itself, the integration of those learning activities in the school program was particularly important to maximize its success and sustainability (Snoek, Enthoven, Kessels, & Volman, 2015; Cordingley, 2015; van Veen, Zwart, & Meirink, 2012). Therefore, the one-shot model of Teacher Professional Development is one of such models that have been identified to be lacking in the following area of intervention.

Lacks Continuity and Follow ups

The one - shot seminar model of teacher professional development has been said to lack follow ups and monitoring mechanisms which are essential elements for an effective teacher development model (Mwaruma, 2013; Summey, 2013). This situation, researchers say it fall far short of the expectations of a model to enhance teachers professional development and to bring about meaningful learning in teachers (Darling-Hammond & Richardson, 2009). The one – shot seminar usually fail to evaluate teachers’ experiences on content discussed during previous sessions. Thus each session usually have a new topic of discussion making the process of TPD to be fragmented and can even distort the professional development process of novice teachers.

Steiner (2014) purports that such seminars would have made more sense if inspectors who delivered facilitated the seminars could follow the teachers up in their classrooms to find out their difficulties in implementing what was learned during the work shop or seminar. Some of the teachers even forget the concepts learned during the training session as soon as they return from the seminar because there is no one to follow them up and remind them of what is expected of them.

Irrelevant Content

Steiner (2014) opines that besides being fragmented, disconnected and inconsistent, the content of the one-shot seminar model of teacher professional development fails to meet the learning needs of teachers. Similarly, the National Commission on Mathematics and Science Teaching for the 21st Century (2000) hold that a developed TPD model cannot succeed without a strong content that deepens teachers' knowledge on subjects matter, sharpen teachers' classroom teaching skills, keep up with development in the subject, increase ability to monitor students and contribute knowledge in the field of education as a whole. To compliment these stipulations, a relevant model for teacher professional development needs to bring forth learning contents that are interesting and meet the professional aspirations of the teachers (Darling-Hammond & Richardson, 2009). Other researchers have purported that the topic chosen for seminars and workshops usually do not address the actual problems teachers face in the course of executing their teaching tasks (Villegas-Reimers, 2003). Education hierarchies usually just sit in their offices and select contents that they master best and embark on seminars and workshops. Due to the fact that these contents do not meet the learning needs of teachers, it is obvious that the knowledge they acquire will be of no consequence to their professional improvement thus failing totally to motivate and improving the teaching skills of teachers (McAleavy, Hall, Horrocks & Rigall, 2018)

Ineffective Modes of delivery

An effective model of teacher professional development needs to use the hands on and collaborative methods (Caena 2011) but contradictorily, the one-shot seminar or workshop model

dwells much on the use of the lecture method (McMurray, O'Neill & Thompson 2016). Caena (2011) further purports that the least useful model of TPD is that whose modes of delivery is too theoretical with little practical based demonstrations. During such sessions, some facilitators make teachers to feel very humiliated and belittled as they are made to repeat word patterns in unison like kindergarten kids (Strauss, 2014). This situation is further buttressed by Burns (2018) who hints that during the delivery of the content in seminars; the seminar facilitator is looked upon as an “omniscient” warehouse of knowledge pouring it out on unknowledgeable teachers who most often are passive recipients of the content. This thus confirms the fact that most seminars are highly theoretical and encourages rote memorization of facts which is an ineffective way of acquiring skills. Besides, during workshops in most major cities in Cameroon, the seminar venue is usually not large enough to contain the teachers who have been invited for the activity. As such teachers sometimes stand at the windows, sit on pieces of wood or bricks in the sun, trying to pick a concept or two which they jot down on pieces of scratch paper which they often discard as soon as the training session is over.

Short Duration

To have an effective teacher professional development program, teachers must be involved in related activities for between 60-80 hours per academic year (Guskey, 2000; Supovic & Tuner, 2000). Contrarily, it has been purported that poorly funded seminars usually hold just once a year for about 1 – 3 days (Burns, 2018). Usually, the daily schedule could be from 9am – 3pm (6hours daily) in the same vein, Nkwenti (2014) intimates that in Cameroon, basic education teachers undergo PD sessions once a day for eight (08) hours and the same scenario is repeated every term cumulating to 24 hours per school year. This period is grossly insufficient for an effective teacher professional development to take place. Besides, Burns (2018) suggests that the one- shot seminar model looks at teacher professional development as an event and not a process. The researcher holds this claim because at the conclusion of the seminar participants are made to think that all official teaching and learning has ceased until the next workshop. This idea stands sharply in contrast with researchers who have advocated that an effective teacher professional development program is a process which is continuous and ongoing over a long period of time (Guskey, 2000; Supovic & Tuner, 2000; Burns 2018; Koellner & Greenblatt, 2018).

More specifically, insufficient time for TPD appears to be a key condition that hinders or facilitates its implementation and sustainability. The time it takes to invest depends on the type of TPD activity (van Veen et al., 2012). However, most studies conclude that professionalization activities should be integrated into the teacher's work and should be sustained and intensive, rather than short-lived and sporadic. Therefore, a significant number of contact hours over an extended period of time should be included. This also affects the types of activities teachers should participate in. One-off workshops and conferences are less likely to result in teacher changes (Cordingley, 2015; Earley, 2009; van Veen et al., 2012). According to Admiraal et al. (2016), teachers need time to develop, discuss and practice new knowledge. Other authors have therefore emphasized the importance of 'protected time' or 'reduced instructional duties' during working hours to give teachers the opportunity to become professionals (Ermeling, 2010). However, spending too much time on TPD can also have negative consequences. Teachers are often under tremendous workload, and pressures for professional development can add to this (Telese, 2008). In addition to time, "sufficient resources" must be available. Resources refer not only to physical resources such as books and money, but also to social resources such as long-term coaching and ongoing on-call support (Imants & van Veen, 2010; van Veen et al., 2012). Finally, research has shown the importance of having a "clear procedure" for TPD, characterized by a circular, approach-oriented conversation cycle about work between teachers and peers (Vekeman, Devos, Valcke, 2016). A cyclical approach of assessing school conditions after interventions and basing new interventions on previous results may be of value (Kuijpers, Houtveen, Wubbels, 2010). Therefore, sufficient time and space should be provided for teachers to give each other feedback and evaluate the professional development process (Imants & van Veen, 2010). Furthermore, the content of TPD interventions and the learning process of teachers need to be integrated into the school context (Darling-Hammond & Richardson, 2009). To achieve this, it is important that school leaders consider the content of her TPD intervention. For example, several studies highlight the importance of focusing on student learning and outcomes (Darling-Hammond & Richardson, 2009; Timperley, Wilson, Barrar & Fung, 2007; van Veen et al., 2012). In addition, interventions should be of an adequate level and include clear, specific and activating teaching methods (van Veen et al., 2012).

Cumbersome Teachers' Workload

The workload of teachers especially those in the basic education sub sector is very cumbersome as they are expected to prepare teach about seven lessons a day. Leaving their schools to attend seminars at an appointed venue is viewed as an additional task to their already very busy schedules (Sprague, 2007). To Liu (2020) going for seminars and workshops is regarded by lazy teachers as a day off and a day to socialize and meet other people of the same profession and not as a day of learning. It is also worth noting that while teachers are away for a day or two in order to attend seminars, pupils' learning is halted and the coverage rate of the curriculum is also brought to a standstill. This will give an extra work to the teachers who will be expected to cover the work within the expected duration.

Due to these weaknesses of the traditional model of teacher professional development, the landscape of teachers' professional development in the world over, is experiencing a shift from the traditional one shot- seminar to a more collaborative, long term and mobile model (Liu, 2020). On one part, this shift is based on teachers' dissatisfaction with the one-shot seminar model as amongst others; it fails to incorporate the reality of teachers' busy schedule (Sprague, 2007). On the other hand, it is based on the desires of teachers to satisfy the different needs of different learners (Friesen & Clifford, 2003), using technology to become agent of change transforming the existing social order and empowering all students (Darling-Hammond, 2002). The weaknesses of the traditional models of TPD have guided other researchers to purport the use of an entirely web based model for TPD (Odzemir & Pan, 2016; Dede, 2006; Koch and Fusco, 2008; Lloyd & Duncan-Howell, 2010). However, Liu (2020) suggests that putting in place a model which is entirely web-based will not be ideal, rather there should be mélange of the web-based model and the traditional models. Similarly, Douglas-Feraci (2010) opines that using a model for TPD which relies entirely on the web will not be sufficient for all domains of teacher professional development. Despite the model upheld, researchers have prescribed the preferences of teachers to developers of mobile based models for teacher development.

Research has highlighted the relevance of working conditions to mobility and sustainability of teacher development interventions, but most of these studies have always focused on their impact (Opfer & Pedder, 2011; Cordingley, 2015). Specifically, previous research on teacher development has failed to elucidate the specific links that exist between teacher development and local working conditions such as adequate time, supportive culture and resources, and how

school leaders use these (Offer & Pedder, 2011; Cordingley, 2015). A more detailed and systematic study of the use of teacher training in school facilities, particularly the working conditions that facilitate effective transfer of her TPD within the school, remains desirable. School leaders play an important role in this regard, as they are at the forefront of collaborating with other educational hierarchies in organizing teacher development events (James & McCormick, 2009; Gaikhorst, Beishuizen, Korstjens & Volman, 2014).

It is Facilitator Centred

Because they are facilitator-centric, seminars and workshops can model traditional and hierarchical methods of professional development (Burns, 2018). By its design, the workshop practices suggest that the information rests with an all-knowing facilitator whose task is to impart knowledge to the 'less knowledgeable' teachers. Even if the facilitator is an expert in the topic shared, they may not have extensive teaching experience or experience teaching in the same context as the workshop teacher. Before a workshop, facilitators often have little or no knowledge of the teachers they teach which makes it difficult or even impossible for the trainer to have a glimpse of the professional difficulties and aspirations of the participants. Besides the one-to-shot model fails to meet with cultural and local differences as the facilitator will always present content based on his/her experiences and perceived local realities. Such an attribute falls short of the stipulations of Imam (2022) who thinks that TPD programs should be provide ongoing support and feedback through activities such as team teaching, joint assessment of plans, targeted peer observation, and teacher-educator support. Another researcher also purports that it is important to consider the teacher's developmental level and needs, and feedback and support should be based on the teacher's needs (Christine Coombe, 2020). Teachers with the same weaknesses can plan and teach together to improve different aspects of teaching (Richards & Farrell, 2005). As Fullan (2001) points out, colleagues are the most effective when teachers need help. In other words, learning requires teacher-teacher-educator interaction and cooperation (Nguyen, 2019) and not a one sided training based on the perception of the teacher educator. Edge (2002) argues that co-development is a necessary part of the TPD. Imam (2022) further indicates that the professional teachers also need to be provided with an opportunity for them to reflect critically and systematically on their own practice while cultivating new perspectives. In this case, the teachers will need to practice, reflect, and evaluate what they taught during their

lessons in their respective classrooms. In which case a robust system must be put in place to monitor the process. Involving teachers in the process changes their role from recipients of input to active participants who can make decisions and act independently. Teacher engagement increases retention (Abbaszadeh, 2021), and engaged teachers improve teaching and have a positive impact on learner engagement (Cardwell, 2011). Teachers as educators (Knezevic & Scholl, 2002) need time to expand their knowledge and skills (Richards & Farrell, 2005). This process must therefore be continuous and sustainable.

Teachers' preference in the Design of a Mobile Learning Model for Teacher Professional Development

Teacher Professional Development (TPD) is not a new phenomenon (Itsoe, Victor, Pitsoe & Letseka, 2014). These days, it is on the agenda of many educational institutions around the world. It has caused a lot of debate both within and outside of the academia. The researchers further depict that the international social policy and educational research literature increasingly places TPD in the context of lifelong learning. However, professional development has improved teacher knowledge, teaching, skills and practice, and student outcomes. It is widely recognized internationally that TPD is an important mechanism for improving teaching and student achievement. In this light Yoon et al (2007) posit that professional development affects student performance in three stages. First, professional development improves the knowledge and skills of teachers. Second, better knowledge and skills improve classroom instruction. Third, improves student performance. Weak or out-dated educational practices cannot be expected to improve a student's ability to learn. Most importantly, students do not benefit from their teachers' professional development if, for example, they fail to apply new ideas from professional development to their classrooms (Itsoe, Victor & Letseka, 2014).

Moreover, a lot has been written about TPD, but one of the most noticeable gaps in modern writing about TPD is that it does not view TPD as a multi-faceted process which takes into account an amalgamation of the peculiarities of teachers and that of the educational system to form a whole. However, recent research findings have postulated that TPD program should be compatible with a behavioral view of learning in which both curriculum and instruction are divided into small sequential steps directed by practitioners in the field of education. Thus, New

forms of professional development are needed which is not too tied to bureaucracy. Against this background, it can be argued that teachers play an important role in professional development and school reform. Just as students learn through conversations with their teachers, teachers learn through conversations with their peers and mentors (Itsoe, Victor & Letseka, 2014). Therefore, professional development professionals should recognize that teachers should not be viewed as passive objects when designing TPD packages.

It is for this reason that Manal and Jayanti (2022) think that an effective TPD program must consider human behaviour and motivations when designing and implementing the program. The researchers hold that these include identifying and removing motivational barriers teachers may face in participating, learning and applying new skills. Here, Manal and Jayanti (2022) outline 10 strategies for addressing teachers' preferences as far as motivational barriers are concerned. The researchers established three stages, based on empirical evidence and national practices, particularly from Kenya, Peru, Yemen, and Zambia experiences. The three stages and ten strategies to address teachers' preferences in designing TPD programs as advocated by the researchers are as follows:

Stage 1: Participation in TPD

Strategy 1: Diagnose TPD and adapt it to professional needs and classroom settings so teachers can understand it. Data from classroom observations and teacher surveys can be used to identify and prioritize teachers' learning needs to better meet their needs. Studies show that adults are better able to learn new skills relevant to their needs and situations.

Strategy 2: Clearly communicate the goals, details and benefits of TPD to help teachers make informed decisions about participation. Break down information barriers that can limit or influence teacher engagement by contextually using the teacher's preferred communication channel. Lack of or inaccurate information about the goals, relevance, plans, and incentives of TPD programs can adversely affect educator decision-making and ultimately motivation to participate.

Strategy 3: Allow choices to make teachers feel more responsible for their own learning. The flexibility to choose not only content (what to learn) but also mode (how to learn it) and time (when to learn it) enhances teacher ownership and motivation to learn.

Stage2: Acquire new skills and knowledge

Strategy 4: Provide hands-on opportunities to engage teachers. It integrates practical and active learning strategies, such as effective practice modeling and practical application, mindful practice, and creating opportunities for reflection and inquiry, to improve teacher learning and retention. Active Learning Opportunities is a hallmark of adult education, which enable teachers to transform their teaching, rather than simply laying new strategies on old ones.

Strategy 5: Provides targeted opportunities for teachers to improve their skills. As with a customized approach, using existing data to identify specific skills or sets of issues for TPD to focus on can help boost motivation. There is evidence that focused learning and practice is more effective than learning multiple things at once.

Strategy 6: Meet teachers' social and emotional learning needs (SELs) and enable teachers to build positive emotions and beliefs. Adopt practices that address teachers' SEL needs, and leverage existing data to diagnose and design TPDs that address teachers' false beliefs. Teachers can experience negative emotions (stress) and beliefs (prejudice) that can affect their motivation, desires, and even their ability to learn and adopt new skills.

Stage3: Applications of TPD Learning

Strategy 7: Provide regular feedback during implementation so teachers feel supported and encouraged to keep trying. Approaches could provide teachers with face-to-face, virtual, or mixed access to mentors and coaches who can provide structured feedback. Research shows that getting feedback from knowledgeable observers can help teachers practice.

Strategy 8: Provide opportunities for collaboration so teachers can build relationships. Form one-on-one or small groups. A school-based or virtual community of practice where teachers can learn and grow together. Teachers need to see tangible results to believe in new programs and sustain changes in classroom practice. By working with learning communities, teachers are better able to maintain their enthusiasm for introducing new practices.

Strategy 9: Provide ongoing opportunities to keep teachers engaged. Ongoing support include regular workshops, coaching sessions and engagements on online platforms. Consider also providing access to supporting materials such as teacher guides and lesson plans to increase

engagement. It takes time for TPD to translate into real change, so follow up on TPD opportunities and design ongoing support.

Strategy 10: Recognize and reward teachers who have successfully applied TPD learning content so that they feel a sense of accomplishment. Align TPD with career paths and teacher standards. Provide a certificate and celebrate success. Teachers often lack the motivation to apply what they learn in their TPD programs because their efforts are poorly valued and career advancement opportunities do not depend on increased effort.

Besides the strategies presented by Manal and Jayanti (2022) other researchers have propounded other preferences of teachers in designing an effective mobile learning model for teachers' professional development, these researchers have proposed that the model should take the following into consideration.

Teachers' Learning Needs

In designing a meaningful model for TPD, the needs and aspirations of the teachers must be taken into consideration and placed at the centre of the process (Galaczi, Nye, Poulter & Allen, 2018). For teachers to actually participate and effectively learn in a TPD program, the designers of the model must ensure that the design meets the common characteristics of the teachers who will be engaged in the learning process (Wenger, McDermont & Snyder, 2002). Thus, the model should be that which fosters communication between teachers and educational planners, so that when planning for professional development activities, the teachers can easily be contacted to express their professional learning needs which can then be used a spring board for planning of TPD activities. The needs of the teachers are simply contents which they intend to learn in order to improve on their classroom practices. These needs could be related to subject contents both in depth and in breadth as well as it could be related to teaching methodologies, evaluation criteria, dealing with weak learners as well as how to evaluate learners. The underlining principle is that the needs of teachers are many and diverse for which the designer is expected to identify these needs and classify them. Once the designer identifies the various needs of the teachers, he can now move on to set the goals and objectives of the training session(s).

Learning Goals

The goal setting process for teacher professional development is a continuous and recursive process in which teachers reflect on current professional practice, identify professional growth goals, create a professional development plan to reach these goals and track their progress towards attaining them over time. Thus, it is all about teacher self-assessment, goal setting and professional growth. Goal setting for TPD and its attainment are woven and applied throughout the year to positively impact each teacher's professional practice and ultimately improve student performance. Thus, the goals of TPD should not be static. It should be continuous as the teacher is expected to evaluate each lesson taught and set goals on how to improve the upcoming lessons. Therefore Liu (2020) purports that in designing Teacher professional development programs, the goals must be co-formulated with the teachers in order to ensure that their aspiration are enshrined in the central goals for TPD. Researchers have also advocated that the goal for TPD should be made in a bottom top manner, in which teachers express their professional growth objectives which hierarchies can then integrate into the national or regional TPD goals. This is not however the practice most often as educational hierarchies sit in their offices and formulate TPD goal that do not match with the individual professional development goals for the teachers at the grassroots. It is for this motive that Barab et al (2006) postulate that when forming CoPs of TPD, the leaders should also ensure that they collect data on the professional development goals of the different members of the community and integrate the goals into the community practices.

Barab et al (2006) hold that a web-based learning community for professional development is greatly influenced by the objectives of the community. To the researchers, all other design considerations of the learning model, will be determined by the objectives which the learning community intend to achieve. Liu (2020) holds that the objectives for any web based learning model for teachers' professional development is aimed amongst others at facilitating teachers' professional growth, inquiring both into their own and other teachers' classroom practices, sharing inquiry based resources, lesson plans, valuable websites and other valuable materials used in enhancing students' learning, connecting with other teachers who have different degrees of experience and similar interests towards achieving professional growth. These goals should be derived from the perceived learning needs of the teachers (Kowalski, Busey, Bates & Beilstein, 2017).

Meaningful Content

After stating suitable objectives for an effective teacher professional development, contents that will be useful in attaining the objectives of the TPD program needs to be selected. Based on the stated objectives, the content used for TPD should be rooted in knowledge based on teaching (Hagg, 1996). The knowledge based on teaching is multi-dimensional involving Pedagogical Content Knowledge (PCK) (Jan & Berry, 2012). Here, the TPD program designer is expected to include contents that will improve the pedagogical skills of the teachers as well as content that will improve the quality and teachers' mastery of their subject contents. The researchers further postulate that PCK is a great way of enhancing teachers' professional development as it is highly topic, person and situation specific. Here, it is seen that the content is not chosen haphazardly by educational hierarchies but the content is a product of a situational analysis which reveals what teachers really desire to learn. Thus when contents of TPD are systematically selected, the content become interesting to the teachers and addresses their learning needs.

Guidance by More Experienced Teachers

In designing a TPD package, teachers have expressed the need to be guided by more knowledgeable or experienced teachers (Berry 2019). World Bank (2022) is of the opinion that this desire by the teachers can be made concrete by using a method of delivery of TPD content known as Modeling of Best Practices. Modeling Best Practices Method (MBP) is defined by World Bank (2022) as representing a "method" of teaching or teaching methods or A Pedagogical Approach for Teachers in which a more experienced teacher demonstrates or shows other teachers how to carry out the instructional process and in return the teachers can model the learned practices in their respective classrooms. In using the Modeling Best Practice Method, a variety of technology and face to face-based modeling methods can be used, which includes demonstration lessons from experts and educational leaders, interactive hands-on examples, or peer observation. Audio demonstrations (such as sound clips of speech) and curriculum materials containing sample assessments and student work are also examples of modeling techniques (Darling-Hammond, Hyler, and Gardner 2017). While this method helps the teacher access TPD opportunities, the essence of this method is to provide a support system to help the teachers apply TPD concepts to the classroom. Frequency may vary from weekly or monthly access to ongoing access to digital resources. Modeling Best Practices can be used as a standalone TPD method or complemented by other TPD methods. In any case, this is an active learning strategy that TPD

experts can use as a feature of adult learning theory in Teacher Professional Development Programs. This is because it is all about about transforming education, not simply superimposing new strategies on top of old ones (Trotter 2006).

In using Modeling of Best Practices, some technologies are commonly used. MBPs are typically best practice self-help multimedia videos or Illustrative vignettes accessible through technological devices such as tablets, computers and smartphones. Teachers can also learn asynchronously by following video shows. The classroom of the beneficiary's colleague or other classrooms with similar circumstances. Some research emphasize synchronous modeling. This allows beneficiary teachers to learn by observing more experienced remote teachers in satellite classroom setups that require projectors, screens and webcams or a laptop and a satellite broadcast of live lessons. In low-tech environments, teachers can access multimedia content offline pre-installed on the device or provided to the teacher on a Secure Digital (SD) card, CD or DVD. In some cases, modeling may include electronic units or lesson plans, or teachers may share pictures on their behalf. Classroom videos can be viewed through web-based chat. The importance of MBP cannot be overemphasized. There is evidence that the overall effect of consistently incorporating the technology-based MBP techniques emphasize the importance of active learning strategies that greatly supports retention of acquired knowledge during TPD learning.

Besides Modeling of Best practices, teachers can also be guided by coaches through a TPD method known as coaching. TPD coaching is a method of enhancing Teachers' Professional Development. Coaching Focuses on both content and practice, not just one or the other. In coaching, Instructional trainers act as thinkers in collaboration with teachers. Partners, guides, supporters who Reflect and encourage less experienced teacher to improve their practice of teaching (Archibald, Cogshall & Goe 2011). Professional learning activities such as Instructional coaching can affect student performance improve the knowledge and skills of teachers, Make a positive impact on teaching and student learning.

TPD coaches play a key role and are essential to the success of the TPD program and to encouraging teachers to implement new instructional strategies. In other specific cases, Coaches help teachers share experiences, clarify concepts, solve implementation problems, provide teaching tips, reinforce TPD concepts, and help teachers to also encourage others to help

contextualize the learning content. With some training, school staff and project coordinators can also serve as mentors to teachers in resource-scarce settings. TPD coaches can also share helpful resources, such as instructional videos, with their teachers to support their learning. The elements of the coaching program can be adjusted according to the existing needs and circumstances. The frequency of coaching can vary from weekly, monthly, to ongoing. The ratio of TPD coach to teacher varies up to 1:1 as coaching sessions allow coaches to work individually with teachers to help them achieve specific professional development goals and provide personalized support (Wilichowski and Arengue 2022). This method can be used as a stand-alone ongoing activity or as a complement to other TPD activities.

Less experienced teachers can also be placed under the guidance of more experienced teachers through a process known as mentoring and tutoring. Mentoring and tutoring is a model of teacher professional development in which newly recruited teachers in teacher training institutes are placed under the guidance of more experienced teachers (Yelena, 2017). Mentoring is also believed to be a process in which a more experienced professional shares their experiences and practices, providing support and guidance to a novice professional (Geeraerts et al, 2014; Long). , 1997; Salleh & Tan, 2013). Thus, mentoring is a covert process of teacher professional development by which an experienced professional teacher provides others with information, support, feedback, and help with the aim of completing improve current teaching skills, develop news, and improve problem-solving and decision-making in a way that promotes professionalism. Although this is a traditional model for improving teachers' professional development, it is very effective in helping novice teachers quickly become experts (Ganser, 2000; Hudson, 2013). . Studies of beginner teachers have demonstrated that the first three years of teaching play an important role in shaping teachers' perceptions of the teaching profession and helping beginner teachers decide whether to stay or not leave the profession. Beginner teachers need the most support to improve their teaching and classroom management skills. They also need a strong support system to help them see teaching as a collective effort rather than an individual effort. Mentors can offer advice, suggestions, and constructive feedback that can make the difference between the success or failure of a new teacher There are both group and individual mentoring, where the most experienced teachers work with a group of new teachers and individual teachers (Salleh & Tan, 2013). Both mentoring and tutoring foster cooperation and

interaction between experienced and new teachers, leading to improved teaching practices for novice teachers.

Content format

The format in which the contents are presented is of great significance to the teachers. Brodesky, Fagan, Tobey, and Hirsch (2016) hold that the format of the content should be based on the choice and preference of the teachers (Kowalski, Busey, Bates & Beilstein, 2017) purport that based on the choice of the teachers, the content could be presented in both text, audio, picture and video formats. These researchers suggest that in choosing the format data should be collected from the teachers concerned who will be expected to express their view points as far as the format of the content is concerned. This is done based on the fact that some teachers might prefer text while others will prefer videos and images and another set of teachers might equally a blend of text, images and videos. The use of videos in the professional development of teachers have been said to have great effects on the learning process of teachers, just Seidel , Sturmer, Bloomberg, Kobarg and Scwindt (2011) advocate that the use of pedagogic videos in TPD enhances motivation, resonance and ability to reflect critically on events. The format of the texts and the video should also be taken into consideration because not all mobile technologies used by the teachers can access the different formats of content. For example, in presenting content in the form of text, the designer needs to be sure if the mobile gadgets of the teachers can access the text the form of PDF form or MS Word. This should be particularly taken into consideration when designing tools like webinars which incorporates video and sounds in carrying out training activities. This can make use of a method of TPD which the World Bank (2022) refers to as Educational Digital Resources.

Digital Resources for Teaching (DRT) is a TPD method by which Teachers receive digital materials which presents a clear explanation or presentation on how to conduct lessons or new teaching praxis (World Bank 2022). DRT materials include educational or digital content for Teachers such as multimedia resources, Open Educational Resources (OER) content for classrooms, teacher guides, lesson plans, student activities or assessments. These can be structured (attached to the syllabus) or unstructured (more general but on-topic so teachers can use them as needed). Educational software can use any technology that facilitate Lessons (smartboards, mobile applications, etc.). The DRT methodology provides the Teacher with the

flexibility to access TPD opportunities on an ongoing basis. A DRT can be a stand-alone project aimed at improving teachers' technical expertise and digital pedagogy. It can also be used to complement other TPD activities, especially when Teachers need to teach using new teaching methods (software, technology, computer-assisted learning) or curriculum.

For the sake of flexibility TPD content can be provided with the use of audio tapes which provides teachers who were unable to attend professional development an opportunity to learn new ideas from experts through their voice recordings. Most teachers' organizations and associations provide information about lessons or teaching proceedings through audiotape, CD-ROM, and MP3. This provides an opportunity for teachers who cannot attend the training session to listen to and learn from the tape.

Collaboration

Teachers' collaboration is a strong means of ensuring Teachers' Professional Development (Saul, 2016). The researcher holds that in the process of enhancing their professional development, teachers prefer a model which will enable them collaborate with other teachers in their district, city, state, country and even above the world. Through the use of various platforms and forums, teachers take their professional development into their own hands and discuss issues that will help them improve on their practice of teaching. Teacher collaboration occurs when members of a learning community decide to work together in order to improve on their professional practice as a strategy of improving on students' learning (Davis, 2020). The researcher further posits that when teachers come together to share information which will be used in enhancing their PD, learning becomes more accessible and effective. Further insisting on the fact that TPD does not take place in isolation, Darling-Hammond and Bransford (2005), Shulman and Shulman (2004) and Hagg (1996) advocate that current professional development favours the creation of learning communities in which participants collaborate with peers on meaningful activities and co-construct knowledge about teaching.

World Bank (2022) holds that such collaborations can take place in a community of practice.

In the context of this study, Communities of practice (CoP) is defined as a forum to provide avenues for teachers to reiterate and implement key take aways from TPD trainings (remote, blended, or in-person), discuss teaching practices, address challenges (content knowledge, pedagogical, classroom, or school-related), and reflect together to improve teaching (Ralaingita,

2021). Meetings may take place among teachers within a school or involve teachers from a cluster of schools. CoPs provide participants with a space to contribute and can help develop a collective sense of shared endeavour. The CoP method helps teachers not only to engage in TPD opportunities through support from peers but also to apply TPD concepts in the classroom. The frequency of CoP can vary from ongoing unscheduled discussions to weekly or monthly scheduled discussions among teachers. CoP typically is used to supplement other TPD activities, including as a fully offline (in-person) element to facilitate another tech-based or blended TPD. In low-resource settings that often lack access to training and professional development support, CoP also can serve as a standalone method to motivate teachers to continue learning from one another's successes and challenges. In using COP, certain technologies are commonly used. Inline with this, CoPs are typically mediated through internet-based chats to enable the exchange of educational resources. Classroom photos of activities and ideas to address classroom challenges. In other cases, teachers/PLs can connect synchronously or asynchronously between videoconferencing platforms. Through social media groups and applications, Teachers can connect even in remote environments with intermittent or non-existent internet connectivity. Text messages and voice calls. Alternatively, teachers can form a team directly and utilize it. Technology in CoP. for example, technology to watch and watch multimedia videos from a colleague's classroom Design lessons using technology. The Effectiveness of Cop in enhancing TPD cannot be undermined. Embracing the technology-based CoP approach tends to have a significant impact on teacher outcomes. This method is especially beneficial for Teachers in rural and vulnerable situations. Conflict and Violence; even in situations where teachers feel isolated or absent How to access the TPD. The use of CoP increases teaches' interest and engagement in teaching because teachers can share challenges and ideas with each other, in addition to new insights. Teachers who have used COP appreciate the value of getting immediate answers to questions and sharing ideas, collaborating with colleagues to impart both pedagogical knowledge and teaching strategies. Additionally, teachers generally reported feeling connected to their peers they shared innovative practices through photos and videos, including new ways to organize classrooms.

At the same time, several studies have shown the value of good connections in schools, pointing to camaraderie and collaboration in the context of TPD (Clement & Vandenberghe, 2001; Shah, 2012; van Veen et al., 2012).). Collegiateness refers to the quality of relationships between staff,

while collaboration refers to how teachers work together for professional purposes (Kelchtermans, 2006). Communication between teachers is important. It is more effective when done in a collegial way (Kelchtermans, 2006). Victim and Pedder (2011) conclude that the intensity of collaboration is also important for effective her TPD. Too much collaboration stifles, too little collaboration stifles change, but enough collaboration allows teachers to feel supported by their peers. The literature on Professional Learning Communities (PLCs) seems to confirm the importance of 'collaboration' (Admiraal et al., 2016). PLC creates important conditions for a sustainable form of collaboration and collaborative learning between TPD and teachers (Little, 2006). SPS focuses on collective reflection, feedback, and improvement of classroom and school work. The characteristics of such communities are: Cooperation, mutual trust, shared vision, shared norms and values, and feedback. In addition to "cooperation" and "fellowship" there must be "mutual respect" and "equality" among colleagues. If so, they will learn more from each other (Darling-Hammond & Richardson, 2009). Contradictorily, Davis (2020) posits that teacher collaboration is a major challenge to many teachers and school administrators as it is inconsistent and unstructured. Such collaboration can take place through focused group discussions which is a sequential four-step process that can help teachers think together about a teaching-learning problem, big or small. Moderators lead the conversation by asking a series of questions that elicit responses from the participants. The questions and answers take the group from the surface of a topic to its deeper implications, opening the teacher's mind to learn from the topic under discussion. The four stages of focused discussion presented by Stanfield (2017) are: the degree of objectivity where questions about facts and external realities arise; the level of reflection in which questions about hidden feelings and images are raised; interpretive level where questions of importance, ideas and implications are raised and finally decision level where questions of solution and prediction are raised. Such activities in focused conversations help teachers develop their professional skills.

For the sake of building stronger collaborations, to be Network a variety of digital media strategies and networks can be used. Vertical and horizontal boundaries at the school and system level must become interdependent and mutually supportive for teachers. Electronic networks such as WhatsApp, tweeters, and blogs can effectively meet the needs of teachers to communicate with a larger and more diverse group of educators beyond their school staff. All that is needed is a computer, a modem and a phone line to connect teachers to the electronics

village. An open education system can connect teachers to online libraries, databases and other existing communication systems. On these communication platforms, participants can discuss issues such as assessment, technology in the curriculum, environmental and global education, second language teaching, problem solving. Conflict resolution, school leadership and school research, and more. These allow teachers to share ideas and grow in their teaching profession. Online professional development programs can also be used. A number of institutions and educational institutions have developed online courses, tutorials, and self-guided programs for teacher professional development. Programs are developed to allow teachers to stay in their workplace and learn indirectly to enhance their professional development.

Channel of Delivery

According to an article published by National Academy of Sciences in 2002, there are a variety of opportunities for teachers and other educators to engage in professional learning. However these opportunities can be hindered by existing infrastructures, available resources and incentives to encourage teachers to take up the professional learning opportunity. Some of these learning opportunities include workshops, short courses and network participations. Largely speaking these learning opportunities are usually delivered either on a face-to-face mode or through diverse technological platforms. To Burden (2009), the use of technologies in enhancing teacher professional development is of higher consequence than any other channel of delivering TPD programs. The researcher makes such postulations based on the grounds that delivering TPD programs through technologies enable the teachers to gain rapid access to current information as well as it facilitates collaboration with other professionals. Besides, the use of mobile learning technologies in enhancing teacher professional development is flexible, time and cost effective as well as it can address a wider range of audience (McAleavy, Hall, Horrocks & Riggall, 2018). Despite the great opportunities that the use of mobile technologies offers in TPD, researchers have noted that its proper implementation has been slow over the years (Phelps et al, 2004; Peck et al 2002 and Schuck, 2002).

However, adopting a 100% use of mobile learning platform to enhance teacher professional development is not ideal as there is a need for some face-to-face interaction between the stakeholders of the TPD program (McAleavy, Hall, Horrocks & Riggall, 2018). To support this

view point, Burns (2013) carried out a study in Indonesia where teachers were engaged in an entirely online PD program with the use of MOOC and others involved in a blended learning system. At the end of the study, findings revealed that there was a low completion rate in the online program when compared to the blended mode. Burns and Lawrie (2015) push the argument forward by advocating that the blended learning mode best fits in situations of low and fragile financial means.

A series of methods can be used in delivering TPD content, some of these methods as propounded by the World Bank (2022) are as follows:

Duration of Training

Researchers have advocated that to have an effective teacher professional development program, teachers must be involved in related activities for between 60-80 hours per academic year (Guskey, 2000; Supovic & Tuner, 2000). This thus signifies the fact that teacher professional development is a continuous process that goes on for a considerable period of time, thus reinforcing the idea of Burns (2018) who holds that TPD is a process and not an event. Davis (2020) opines that collaboration amongst teachers is the most effective strategy used in fostering TPD. The researcher further posits that even collaboration amongst teachers is a process which should go on over time, just as she describes it as a “Journey” which should be ever changing and ongoing. Hagg (1996) on his part holds that teachers need sufficient time to learn the content of TPD, understand it, practice it and interact with colleagues in order to share ideas and beliefs as far as the content is concerned. Hagg moves on to posit that such an important activity cannot fit into a school day because it will call for a persistent interruption of lessons.

CBC (2023), sharing the practice of TPD orientation in Kenya, indicate that the TPD program in Kenya runs in a cyclical manner for a period of five years. At the end of the five years, the teacher is considered to have completed a cycle made up of modules. Such completion is sanctioned by a certificate. At the end of the five years, the teacher is opened up to begin another five years TPD process which ends up with another re-certification and the process goes on and on.

Moreover, The North Central Regional Institute of Education has developed a research-based professional development framework that promotes ongoing professional development and encourages individual reflection and group exploration of teacher practice. In fact, the following he repeats five overlapping phases, often occurring simultaneously. Building a knowledge database.

The purpose of this phase is to acquire new knowledge and information and build a conceptual understanding of them. Activities at this stage include goal setting, needs assessment, participation in interactive workshops, and formation of study groups. Observation of models and examples. The purpose of this phase is to develop a practical understanding of research by studying teaching examples. During this stage, they may participate in activities such as visiting schools and classes, observing peers, using classroom artifacts, joint planning, listening to and listening to audio and video examples. Review your practice. The purpose of this phase is to analyze educational practices based on new knowledge. Activities at this stage may include the use of diaries and teacher-produced examples for discussion and reflection at conferences. Change your habits.

The purpose of this phase is to translate new knowledge into personal and collaborative planning and action for curriculum and instructional change. Activities may include action research, peer coaching, support groups, curriculum development, etc. Get and share your expertise. The purpose of this phase is to further refine teaching practice, share practical knowledge with peers, and learn from and learn from peers. Activities during this phase may include planning teams, mentoring or collaborating with colleagues, and participating in networks.

Policy orientations to foster the smooth implementation of mobile learning within the basic education sub-sector

Any innovation in the field of education requires careful consideration of the context in which it is to be used, the total set of realities which drive the lives of teachers and the present circumstances in which the learners find themselves (Neal & Kimberly, 2018). Thus, it is important to carry out such situational analysis and formulate policies that will guide the innovation. Concomitantly, Teacher quality and performance have long been recognized as important determinants of education. Successful Education Transformation (Aluko & Aluko,

2008). TPD is a critical element in almost all cases in the contemporary proposal for improving education. However, it is sometimes claimed that TPD is subject to certain limitations or Barriers as a result of political bottlenecks (Díaz Maggioli, 2004).

Such roadblocks can be top-down decisions and lack of personal accountability, no access to professional development processes, professional development opportunities, and few services offered, there is no support for transferring professional development ideas into the classroom. Other barriers include, for example: in other cases, TPD is organized and conducted with the participation of the teacher in a one-on-one or very short sessions (McRae, Ainsworth, Groves, Rowland & Zbar, 2001). In some countries, TPD seems to be often initiated at the national government level where content, funding, organization guidelines and implementation are done strictly by the central government without concertation with the real actors on the field (Ordinance, 2007). Recently, the use of ICT in TPD is progressing.

Trends and current issues in teacher education development. Wang, (2007) hold that, teacher professional training policies should be enacted and led by the government as a way for the state to ensure that teachers adhere to established pedagogic demands as a means of effectively rolling out the curriculum. Husby (2005) argues that excessive state control without adequate consultation of the teachers who are the real actor in the field could render teacher professional learning irrelevant. Hargreaves (2006) and Goodson and Hargreaves (2003) argued that top down policies on TPD issues without consultation of the teachers themselves will help teachers not to yield to the demands of change. It is for this motive that some researchers think that the implementation of Teacher Professional Development programs is usually faced with Political, economic and social dilemmas (Blase, 2005).

Additionally, several studies highlight the importance of alignment between TDP goals and the school's overall policy or vision (Borko, 2004; Desimone, 2009; Little, 2006). This prevents intervention isolation and contributes to the sustainability of professional development activities (van Veen et al., 2012). The broader (political) context must be considered. Interventions are more likely to succeed when policy impacts are consistent with the intervention (Timperley et al., 2007). Previous research has also shown the importance of an open work environment where teachers feel safe, are free to take initiative and learn from their mistakes, and where new ideas

are not evaluated by other teachers or school leaders (Gaikhorst et al., 2014); Kardos & Johnson, 2007; Silins & Mulford, 2002).

The experience of Sweden in aligning policies to TPD is a huge example to emulate, according to Gu and Lindberg (2009) and Gu (2011), the Swedish government has been continuously committed and invested heavily in promoting ICT in schools and encouraging teachers to use ICT for more than a decade. By so doing, both strategic and operational guidelines are provided at the national level. The Strategic Guidelines provide a common idea of the large expenditures required for the use of ICT in education. On the other hand, operational policies, which typically consist of action plans, programs, or projects made at the local levels provide the means to realize these visions (Kozma, 2003). Positive outcomes of this national effort include: developing ICT infrastructure in Swedish schools; linking schools, local governments and industry with teacher education; and so on. Skills required for the use of ICT in the classroom is considered primordial in Sweden. In this regard, a number of top-down efforts and attendant effects have been demonstrated in placing ICT-related changes within the broader context of educational innovation and school reform, especially in the early stages.

In Sweden, the focus of ICT ranges from policies and programs to provide infrastructure and promote its use, to effective use by teachers in the classroom to improve teaching and thereby improve student learning. Things seem to be shifting, creating new demand for teacher training and TPD offers government guidelines of the Swedish Commission for the Reform of Teacher Education (2007) state that new teacher education should provide teachers with the necessary skills to choose her ICTs and media for learning. It has been. In 2008, the Government issued an additional Directive (Government Directive 2008, p. 43) linking teacher education with the eight key competencies for lifelong learning identified by the European Union (2006), declaring responsibility for teacher education was given particular importance. Teachers and schools develop their digital competencies which they desire to be addressed by TPD programs. In the fall of 2008, the Commission submitted a research report on a new teacher education program (SOU (Official Report of Government), 2008, p. 109). The report clearly recommends that ICT should be integrated into all teacher education programs, as well as in the field of education. Resources used. Gu and Lindberg (2009) and Gu (2011) also point out that the lessons Sweden has learned are that successful and effective integration of ICT in education requires not only

central government involvement and it was argued that local governments were also needed for meaningful support and participation in the initiative.

Teachers' knowledge and skills regarding ICT and their attitudes, beliefs and skills regarding the use of ICT in teaching and learning play an important role and were all identified and used in the formulation of TPD policies. Researchers of the Swedish efforts universally acclaimed that ICT competence should be central to the teaching profession and that ICT should not only be the content of TPD. They further advocate that the teachers should learn ICT not only as a foundation of knowledge and skills, but also a means of promoting their effective engagement in TPD in the future. Recently, the power of bottom-up, long-term, recursive, differential, contextualized, collaborative and educational approaches to TPD models has been emphasized (Hargreaves, 2006; Villegas-Reimers, 2003), and the technology TPD model can also include these approaches.

Besides, researchers have advocated that policies are formulated in the context of perceived societal problems or needs and can therefore be preventative/proactive or reactive (Torjman 2005). Reactive policies emerge in order to respond to a concern or crisis. On the other hand, proactive policies consist of a deliberate plan to develop a sector of the society, such as creating programs to improve the skills base of a labour force as in this context which is the teaching force. Another factor that will affect the methods of those interested in creating or changing policy is whether it is currently on the agenda of the state, or whether the related issues have a high public profile in the media (Brendan, Dan, Jesse & John, 2009). The authors further stipulate that effort must be taken in order to attract the government's attention to issues that are not currently high profile so as to demonstrate their importance and the dangers of not responding to them on time.

Beside the types of policies presented in the preceding paragraph, public policy is another type of policy which is of great consequence. Public policy seeks to achieve goals that are considered to be in the best interest of the whole society, often by targeting specific groups within society (Torjman, 2005). The policy provides guidance for addressing a concern through a process of formulation which involves the identification of a set of objectives, and the identification and analysis of a range of actions that can result in promoting the realization of that goal in society. Torjman further postulates that in formulating a public policy, the cost, probable effectiveness,

political context, and community support for each option must be weighed and justified to the decision makers and the general public.

Once potential solutions for the public policy are identified, decisions must be made as to how much of the policy will be implemented at given time. Thus, creating a progress tracking record timeline to continuously assess the rate of progress made over time. This illustrates the range of strategies available to policy designers and the resulting forms that policy can take to tackle a specific goal. Torjman (2005) argues that the process of developing policy can vary widely. The researcher suggests some steps which according to him should be common to all processes. These includes: selecting the desired objective; identifying the target of the objective; determining the pathway to reach that objective; designing the specific program or measure in respect of that goal; as well as implementing the measure and assessing its impact. On the other hand, Sophia, Sara, Adam, Saalim, Lydia, Nora, Neaghan and Asma (2022) outlines the following policy recommendations to ease policy making process;

1. Work with teachers to design TPD interventions

All teachers are professionals who can reflect, critique, develop and recognize one's own practice for making a difference in the application of pedagogic procedures. The TPD initiative should therefore support and collaborate with teachers as individuals. Therefore, TPD policies should be Co-developed by People who use their skills and abilities to enhance teaching and learning (Anwar, 2017).

2. Use EdTech to improve classroom practice

EdTech should be used as an improvement, not a supplement or replace the skills and abilities of teachers and educational practitioners. pre-installed devices for easy access by teachers, innovative teaching and learning resources, Short Messaging Systems containing, digital lesson plans or (semi) structured lesson plans are examples of how technology can be used for improvement of teaching practices of teachers. A well structured digital lesson plan presented sequentially through a technological medium will help where teachers find it difficult to use new teaching techniques (Piper et al., 2015). Therefore, educational Technology must be used appropriately as a measure to ensure that the practice of teaching is actually improved and not impeded.

3. Systematically monitor and assess the impact of TPD Student Learning

Professional learning delivered through the use of technology contributes in improving the quality of teaching and student learning. However, not should be taken that the technological strategies used should be those which can positively impact teachers' acquisition of professional skills. This can be done through constant evaluation of students' productivity to find out if teachers who are engaged in TPD programs through technology are producing students with better academic outputs. If the students' learning are better, then it is an indicator that the teachers are acquiring higher professional competences. In a situation where students' quality of learning is not improving, then the technology used should be reviewed, till a technological strategy which produces better results is gotten to improve teachers' productivity.

4. Using EdTech to Support Teachers and Teacher Educators

Constructed policies should acknowledge the fact that educational technology can greatly support the work of teachers and teacher educators. Structured coaching, the use of software monitoring tools makes it possible to give fast feedback to teachers (Bruns et al., 2018). Thus, in formulating policies on the use of technology in enhancing TPD, the policy makers should be cognizance of the fact that a virtual learning environment enables teacher educators or supervisors to easily and quickly share content with teachers or provide external support to teachers (Basal, 2015) and formulate policies that will contribute positively to this regard. It is also important make policies that will encourage the use of educational technology to improve the work of teacher trainers and school supervisors. This is a way for teachers to reflect on their practice and move forward on personal and reform priorities.

6. Foster trust and positive relationships

TPD works best in an environment of trust and reciprocity of respect between coaches, and teachers with the aim of attaining the goals of the TPD program, and/or Technology in general (Cilliers et al. 2021). The researcher further posits that when making policies on the uses of technology to enhance TPD programs, note should be taken of the fact that coaching through technology loses effectiveness over time due to fact that face-to-face interactions are missing. Thus constructive, supportive and trusting relationships need to be built when using technology to facilitate and thus policies must take necessary measures to build such

relationships which should be sustainable. The policy should foster a climate of trust and acceptance between the various actors of the Teacher Professional Development programs.

7. Consider formal and informal use of Educational Technology to foster a community of practice for teachers.

According to Taner (2018) informal means for TPD model include an organic teacher- or facilitator-led online and/or remote community of practice (CoP) for example through Facebook, WhatsApp, or other commonly used social media. The researcher further purports that in formulating policies to enhance the use of technology in delivering TPD programs, policy makers should consider that mixed models are particularly powerful. To the researcher, mixed model refer to the use of both social media and face-to-face models of TPD. Cilliers et al. (2021) hold that policies to support technology integration in TPD should be those which favour Communities of Practice (CoP). This is because CoP is increasingly recognized as important to a teacher's health, especially during the Covid-19 pandemic and school closures. Effective forms of informal social media use should be explicitly encouraged, but at the same time formulated policies should pay particular attention to ensure that the pedagogical rigour of the concept is promoted and aligned with content of TPD goals.

8. Focus on justice and assistance to the most marginalized.

Policies formulated to enhance the use of technology in TPD should include strategies for using technology to reach and engage marginalized groups of teachers and learners to address their various (learning and professional) needs. These include women and girls, displaced persons, learners and teachers with disabilities. Further research posits that developing countries and regions, even remote areas or rural areas often have additional challenges as far as access and the use of technology is concerned. Therefore, policies must ensure that marginalized teachers and learners benefit significantly in TPD programs through the use of technology. Thus, policy makers should ensure the availability of technology infrastructures like technological gadgets and access to training in the use of the technological tools

9. Consider the TPD ecosystem when designing policies for technology-enabled TPD program.

Considering the entire ecosystem is essential in developing technology embedded policies – (Hennessy et al., 2022) to the researchers, TPD ecosystems include:

■ **District and state level:** at this level, the policy makers are to develop a deeper understanding of structural and cultural factors that can be supportive or limit the TPD efforts through technology.

■ **School level:** At this level, the policy formulators are to ensure that there exists Secure schools and community facilities, material and human resources that can support TPD efforts through the use of technology.

■ **Teacher level:** in developing policies to enhance TOD through technology, the policy makers are to have a deep consideration for teachers' professional learning needs, experience, expertise, motivation and freedom of choice, adequacy and effectiveness of the program.

10. Ensure sustainability of the TPD program

To ensure the sustainability of TPD programs through technology, the cost, level of teacher knowledge of technology, the consent of teachers as regards preference in technology and profitability of the project must be taken into consideration. Policy makers and TPD implementers must consider these elements before embarking on TPD projects through technology.

11. Closely coordinate and manage partners

To achieve the necessary coherence regarding national priorities, the policy need to spell out how coordination between government and other partners such as implementers, sponsors, and TPD providers will be done. Such coordination is aimed at promoting a culture of collaboration and trust so as to avoid unnecessary duplication of functions throughout the TPD system.

In order to accomplish the benefits of mobile learning, UNESCO (2011) recommends that policy-makers should take the following policy orientations:

1. Create or update policies related to mobile learning

existing policies related to mobile learning should updated due to the fact that be most ICT in education policies were formulated in a ‘pre-mobile’ era, which do not really maximize the learning potentials of mobile technology. The few policies which address mobile devices tend to treat them tangentially or ban their use in schools. New policy directives related to mobile

learning should be inserted within existing ICT in education policies, which many governments already have in place UNESCO (2011).

Policy Recommendations

Examine: Examine the unique educational potentials and challenges offered by mobile technology and, when appropriate, incorporate these understandings into broader ICT in education policies.

Avoid: Avoid blanket prohibitions of mobile devices. Universal bans, unless implemented for well-considered reasons, are blunt instruments that usually obstruct educational opportunities and inhibit innovation in teaching and learning.

Provide: Provide guidance on how new investments in technology can work in conjunction with existing educational investments and initiatives.

2. Train teachers to advance learning through mobile technologies

To maximize the advantages of mobile technologies, teachers have to be trained to successfully incorporate them into pedagogical practice. In many instances, a government's investment in teacher training is more important than its investment in technology itself. UNESCO's research has shown that without guidance and instruction teachers will often use technology to 'do old things in new ways' rather than transform and improve approaches to teaching and learning (UNESCO, 2011).

Policy Recommendations

Prioritize the professional development of teachers. The success of mobile learning hinges on the ability of teachers to maximize the educational advantages of mobile devices.

Provide necessary technical and well as pedagogical training to teachers when introducing mobile learning solutions and opportunities. While many teachers know how to use mobile devices, many do not, and as devices grow more versatile and complex they tend to become more difficult to use.

Encourage teacher training institutes to incorporate mobile learning into their programs and curricula.

Provide opportunities for educators to share strategies for effectively integrating technology in institutions with similar resources and needs.

3. **Provide support and training to teachers through mobile technologies**

UNESCO (2011) found out that very few education systems use mobile technologies to support the professional development of teachers, even though this is often a practical and cost-effective method to assist educators, especially those working in remote and resource-poor areas. One-size-fits-all approaches to professional training are insufficient for teachers as well as students, and mobile learning offers a promising avenue to better personalize curriculum and instruction for both groups.

Policy Recommendations

Ensure that, where possible, curriculum, educational resources and lesson plans are available to teachers through mobile devices.

Explore the practicability of providing professional development and teacher training with the use of mobile technology.

4. **Create and optimize educational content for use on mobile devices**

Currently most educational content, including digital content, is not accessible from mobile devices, nor does it take full advantage of a unique multimedia, communication and sometimes location-aware capabilities of these devices. Additionally, a great deal of content fails to follow standards or incorporate features that improve accessibility for people with disabilities. Thus content should be of good quality and be tailored to be compatible with many devices.

Policy Recommendations

Ensure that educational resources and content, including existing online repositories, are easily accessible from mobile devices.

Support the open licensing of mobile content to facilitate its widest possible use and adaptation. This can be accomplished by supporting the use of open educational resources or Open Educational Resources.

Create incentives for developers to build content specifically for mobile devices. While it is possible to ‘migrate’ learning materials from computers and textbooks to mobile technology, designers need to ‘think mobile first’, making hard choices about how to streamline content for presentation and use on devices with small screens and limited input options.

Encourage the development of platforms or software that allow classroom teachers (and others with firsthand knowledge of students) to create or tailor mobile content.

Promote the creation of mobile content that is relevant to local groups and accessible in local languages. This can be accomplished by inviting local developers to build mobile learning content for their communities.

Advocate for standards that make mobile hardware, software and content accessible to diverse student populations, including students with disabilities.

5. Ensure gender equality for mobile students

While mobile phones have empowered women and girls in educational, social and economic ways, approximately 300 million more men own mobile phones in low to middle-income countries than women (GSMA et al., 2010). Men are also more likely to know how to use mobile technology than women. The mobile phone gender gap is a symptom of broader gender inequalities, apparent in education as well as in the general use and ownership of ICTs. Policy-makers should work to promote gender equality for mobile learning.

Policy Recommendations

Ameliorate existing ICT in education gender gaps by encouraging women and girls as well as men and boys to leverage mobile technology for learning.

Identify culturally relevant ways of normalizing mobile phone ownership and use for women and girls in particular. Develop strategies to teach women and girls as well as men and boys relevant ICT skills.

6. **Expand and improve connectivity options while ensuring equity**

Most mobile learning opportunities depend on reliable connectivity to the internet and other communication and data networks. As access to information becomes increasingly tied to economic and social development, governments should work with relevant industries to build and augment the technological infrastructure that powers mobile learning. It is also crucial that governments seek to provide equal access to mobile connectivity.

Policy Recommendations

Take stock of existing ICT infrastructure and establish realistic targets for improving this infrastructure incrementally, devoting particular attention to underserved areas.

Support the provision of robust and affordable mobile networks within and across communities, especially in educational institutions such as schools, universities and libraries.

Consider providing full or partial subsidies for access to mobile data and broadband services. Many governments offer ‘e-rate’ subsidies to promote internet access for educational purposes via computers. In addition, governments should now consider advocating for ‘m-rate’ subsidies to promote mobile access to the internet.

Support efforts to build local and ad hoc networks to support mobile learning, especially in settings where larger networks are unavailable.

7. **Develop strategies to provide equal access for all**

Mobile devices hold special promise for education, in large part because a majority of people already have access to one. Collectively, they are the most ubiquitous interactive ICT on the planet. While governments should seek to enlarge learning opportunities for the huge number of people who own a personal mobile device, they also need to ensure mobile learning opportunities remain open to learners who do not have a device. Currently there are three widely practiced models for ensuring people have the hardware needed for mobile learning:

- 1) Governments or other institutions provide devices directly to learners;
- 2) Learners supply their own devices, commonly referred to as ‘bring your own device’ also known as BYOD.
- 3) Governments and institutions share provisioning responsibilities with learners. The BYOD model is attractive because it is inexpensive: the costs of the devices, their maintenance and their connectivity plans are usually shouldered by learners. As a result, BYOD projects can be implemented quickly in areas where most people have mobile devices. However, BYOD has serious limitations if it fails to accommodate learners who do not already own mobile hardware. It can also create scenarios where learners with superior devices and connectivity plans can outperform those with inferior devices and plans.

Policy Recommendations

Ensure equal access to mobile technology and participation in mobile learning for all students and teachers. In the case of BYOD implementations, governments should adopt measures to provide mobile hardware and connectivity to learners who do not have a personal device.

Allow students to ‘own’ their mobile device whenever possible. A principal advantage of mobile learning is that it opens up educational opportunities inside and outside of schools. If students cannot take full ownership of their devices, they are unlikely to adopt them as personalized learning tools and use them in informal contexts.

Encourage government departments and educational institutions to negotiate with vendors and leverage the purchasing power of large numbers of learners.

8. Promote the safe, responsible and healthy use of mobile technologies

Like any ICT, mobile technology can be used to access inappropriate material. In the wrong hands mobile devices can also enable undesirable behaviour – such as bullying, sending violent or sexually explicit messages, and interacting with dangerous individuals – which may exacerbate gender and other inequalities. Data reviewed by UNESCO overwhelmingly indicates that banning mobile technologies in formal systems of education does not prevent young people from using them finally, there are concerns around potential health risks associated with the use of mobile technologies, including eye strain from working on small screens and exposure to

electromagnetic radiation. While most research has concluded that mobile technologies are safe, alleged health risks, especially those stemming from long-term use, should be actively researched (WHO, 2011).

Policy Recommendations

Promote the responsible use of mobile devices by teaching digital citizenship.

Adopt ‘responsible use policies’ (RUPs) instead of ‘acceptable use policies’ (AUPs).

Articulate strategies to balance online interaction with offline interaction in contexts where excessive screen time and over-use of ICTs are serious concerns.

9. Use mobile technology to improve communication and education management

Mobile technology has a track record of making educational administration more efficient, as well as improving communication between schools, teachers, students and parents. By streamlining tasks such as recording attendance and assessment results, mobile technologies allow educators more time to focus on instruction. Mobile devices also facilitate data gathering and improve education management, especially in education systems where fixed-line internet access is unavailable.

Policy Recommendations

Promote the ‘system strengthening’ uses of mobile technologies.

Encourage schools and individual educators to communicate with students and parents through mobile devices.

Extend the reach and effectiveness of education management and information systems by integrating support for mobile technologies.

Consider how mobile technologies can support the collection of educational information following a conflict or disaster.

10 Raise awareness of mobile learning through advocacy, leadership and dialogue

Negative social attitudes regarding the educational potentials of mobile technology constitute the most immediate barrier to the widespread embrace of mobile learning. Broadly speaking, people tend to view mobile devices (and mobile phones in particular) as portals to entertainment, not education, and as a result this technology is regularly dismissed as distracting or disruptive in school settings. Thus, policy-makers can also take steps to educate the public about the benefits of mobile learning.

Policy Recommendations

Highlight and model how mobile technology can improve teaching, learning and administration.

Share research findings and evaluations of mobile learning programs.

Encourage dialogue among key stakeholders – including principals, teachers, learners, parents, local leaders and community-based organizations – about mobile learning.

Provide a coherent vision of how technology, including mobile technologies, will further learning goals.

Beside the policy recommendations made by UNESCO in shaping policy formulation in using technology in enhancing Teacher Professional Development, the OECD based on a review of their prior works and relevant research projects carried out, the research works on TPD proposes five dimensions which can orientate policies related to Teachers' Professional Development. The five dimensions as stated by the OECD are motivation, access, provision, content, and quality.

The sections that follow describe each of the five analytical dimensions and outline a non-exhaustive set of policy issues to illustrate the types of questions that should be addressed under each of the stated dimensions. Around each of these issues, the OECD study proposes to facilitate exchanges amongst colleagues and identify common challenges, strengths and possible areas of innovations in order to support participating areas in developing policy responses to the needs of TPD.

Motivation

What guides teachers' motivation to engage in TPD? (Dimension 1) By providing teachers with the appropriate incentives to undertake TPD programs and at the same time recognizing the importance of their autonomous and self-initiated engagement in professional development

activities, is an epi-central challenge in building holistic TPD systems. Coming to the understanding of teachers' motivation and considering it as a serious issue has been seen as an important, if often overlooked strategy to increase the success of professional development (Kennedy, 2016). Considering the diversity of individual teachers' need to motivations for engaging in professional growth, the TPD study has to find out both the extrinsic and intrinsic factors that motivate teachers to undertake Professional Development Programs. Extrinsic motivated behaviour is usually understood to refer to activities that teachers engage in for very important reasons that is due to their association with a desired outcome. Intrinsically motivated behaviour, on the other hand, is autonomous and driven solely or primarily by the teacher's interest for enjoyment of a given activity. Although activities that are usually not interesting or enjoyable, generally need some extrinsic motivation. In reality, different forms of behaviour are provoked by a combination of both intrinsic and extrinsic motivation. This is the case, for instance, where externally defined goals are associated with an activity are in line with the actors' own values and beliefs (Gagné and Deci, 2005) On the one hand, such situation therefore covers the factors that define teachers' extrinsic motivation to engage in TPD programs through incentives or other requirements. This includes motivation like formal appraisal for engaging in TPD programs or award of certificate of participation or completion of a given module, as well as eliciting direct and indirect links between Teacher Professional Development Programs and teachers' career progression as a compensation. EDU/WKP (2020) on the other hand, holds that to stimulate teachers' intrinsic motivation to engage in TPD programs should not only be in formalised TPD programs but also in private and self-initiated autonomous practices initiated by teachers to improve their professional development. Intrinsic motivation is an essential factor which can push teachers to prioritise engagement in Professional Development Programs over many other professional and personal issues, they have on their schedule to deal with. Intrinsic motivation can be vital product of TPD, their personal affinities, dispositions, the satisfaction derived from professional learning and perceived needs. TPD is also shaped, however, by teachers' interaction with extrinsic stimuli and their alignment with teachers' self-selected values, goals and beliefs. Literature of TPD initiatives hold that they can be successful whether they are voluntary or obliged by administration, and that the most important factor is whether the activities teachers are engaged in can maintain and instill a shared sense of purpose among teachers participating in the program (Cordingley et al., 2015). Successful TPD systems can

likely strike a balance and effectively combine elements of external motivation with teacher agency and ownership emerging from within the profession. The TPD study therefore has to consider teachers' motivation in a holistic manner and capture policy approaches and systems that define teachers' extrinsic motivation to engage in TPD alongside those that foster teachers' intrinsic motivation. It also considers how entire systems can build trust and destroy cultural barriers that may impede teachers' willingness to open up their respective classrooms for collaboration and peer learning. In addition, this dimension also include the incentives for other actors, including professional organisations, schools, private actors and higher education institutions to engage in or promote the provision of TPD. Relevant questions to be addressed in this dimension include:

- How can systems foster trust and other norms that support teachers' willingness to engage in professional learning, both individually and collectively?
- How can systems create a culture in which teachers (and their workplace) prioritise TPD in relation to other demands on their time?
- How can systems create a culture in which teachers are willing and open to engage in different forms of professional development, including on externally set priorities and content?
- How can teachers be provided with meaningful incentives to participate in TPD without crowding out their intrinsic motivation to develop their practice?
- How can actors across the system be motivated to contribute to the promotion and provision of effective TPD?

Examples of policy issues and questions for analysis (Dimension 1: Motivation) encourage teacher's intrinsic motivation to engage in TPD programs

Lower secondary teachers in the majority of OECD countries are either mandated system wide or required by their schools to engage in professional development during their statutory working time (OECD, 2018). Although teachers' requirements to engagement in PD are relatively minimal in many OECD countries. Some countries require teachers to engage in a significant amount of PD or provide them with strong extrinsic incentives to do so (for instance by making teachers' promotion, salary progression, or re-certification to be conditional on the completion of

a given set of training modules) (OECD, 2014). Experience has proven that such incentives most often than not are always not effective and may risk turning TPD into a bureaucratic checklist which teachers are compelled to complete, rather than a privilege for true capacity and skill development amongst teachers. In the worst case scenarios, formal requirements may override teachers' intrinsic motivation to engage in TPD (Bénabou and Tirole (2020); Christian, Jacobsen and Andersen, (2013) and OECD (2019).

In addition, it is widely realised that most of teachers' professional development activities are informal, happen in private settings or self-initiated. However, not all educational systems have sufficient means to formally acknowledge the value of these activities for teachers' professional development and to support them in their personal and private professional development activities.

Linking TPD with teachers' appraisal and career advancement

Teachers' regular formative appraisal provides an opportunity for teachers and school administrators to engage in a continuous exchange to identify existing learning opportunities that could enable teachers at all levels of their experience to optimise their potential for professional growth and development. Nevertheless, in many educational systems, the formative function of appraisal, as a strategic means to build capacity and inform teachers' professional development, is underdeveloped. In some systems, formative appraisal rarely occurs, does not occur at all, or only occurs on a voluntary basis as stipulated by (OECD, 2019). In other systems, evaluations of TPD are conducted more frequently, but however fail to effectively inform teachers' professional development agencies (OECD, 2013). Even where such links exist, there is a possible risk that teachers perceive their evaluation as a tool of high-stakes accountability, rather than an opportunity for professional developmental growth (Santiago et al., 2016; OECD, 2019). Existing links between teachers' appraisal and their professional development have traditionally been focused on the remediation and identification of teachers' perceived weaknesses. In 2015, for example, 10 of 19 OECD countries with sufficient availability of data reported that their educational systems follow up on the negative appraisal of teachers' results with compulsory training. Although this negative-oriented approach is still very much dominant in many systems around the globe, the appraisal process can equally assume more growth-oriented forms and give teachers greater opportunities in shaping their professional development opportunities. Five of

the 19 OECD educational systems reported that their systems reward teachers' with positive appraisal results with additional opportunities for in-service professional development (OECD, 2015). Rather than informing the individual teacher's PD activities, appraisal results can also be aggregated to generate topics for collective professional development plans at the level of the school. This approach recognises the broader school wide context in which educators work and understand that teachers improve most when they work alongside their peers seeking strategies to improve professionally on similar dimensions (Johnson, Kraft and Papay, 2012; OECD, 2019). Schools and educational systems may also seek to link teachers' engagement in professional development challenges to their professional advancement. In 2015, 16 of 28 countries with available data reported that participation in professional development programs had a high or moderate influence on teachers' career advancement of lower secondary schools teachers (OECD, 2015). Linking TPD to teachers' career advancement in the form of input-based requirements (e.g. the completion of a given number of modules) risks creating the perception that TPD programs are merely requirements, with little intrinsic motivation. However, links between TPD and advancement in career may be more indirect and output-based, for example, where promotions are given based on an in-depth appraisal of the skills that teachers may have acquired through TPD programs.

Foster trust and a school culture that supports teachers' collaborative learning

In this policy recommendation, the OECD suggests that systems should encourage conditions that can promote professional development by facilitating cross-school and cross-teacher collaboration (Little, 1993; Garet et al., 2001) Teachers' engagement in feedback, collaborative learning communities and peer observation holds significant determinants in improving teaching practices (Stoll et al., 2006). Communities learning can provide safe environments for teachers to experiment debated assumptions on pedagogic strategies that work and why (Timperley et al., 2007). Collaboration also helps to provide an atmosphere of trust and social capital in school environment that enables teachers to continuously reflect on their practices, to develop new teaching cultures and practices, and to collectively solve action problems (Burns and Cerna, 2016). For school teachers to engage in such effective forms of collaborative professional

development activities, they do not require only opportunities and resources, but they also need a professional culture that supports these professional development practices. In some educational systems, teachers do not often engage in peer to peer learning and may be reluctant to open up their classroom to other colleagues or peers, school leaders or mentors. The experience in professional development of countries like Denmark has also proven that external support for collaborative practices is most effective in schools in which school leaders are already actively promoting a culture and explicitly make time available in the schedules of teachers for professional development collaboration (Nusche et al., 2016).

By creating a school culture that encourages and tolerates constructive peer-to-peer feedback amongst colleagues and suggestions to attempt different instructional strategies is not the least easy. Researchers have long pointed to the risk that administratively imposed forms of teacher professional collaboration can create “contrived collegiality,” instead of a genuinely collaborative culture (Hargreaves and Dawe, 1990). However, facilitation and leadership can certainly play a great role in creating the conditions for teachers to collectively develop collaborative professional relationships with their peers, but interventions that are interpreted as controlling and intrusive can be counter-productive. Hence, it is incumbent for a careful balance to be struck between promoting teachers’ ownership and responsibility for their professional development and ensuring that there is sufficient structure and time to allow for effective collaborative practices.

Preparing teachers to become educational leaders

Professional development orientations that permit teachers to expand their professional activities can also play an important role in motivating teachers to engage in TPD. Cultivating leadership capacity is a very important aspect of TPD to this regard. Considering the significant effect that well-prepared school leaders can have on their students’ learning outcomes (Fryer, 2017), academicians and policy makers have increasingly recognised the importance of providing school principals with appropriate training before they assume their leadership role. Effective TPD systems therefore ensure that teachers who aspire to, or are on the way to becoming school leaders have sufficient access to learning opportunities that prepare them for school leadership before they actually assume leadership roles. While TALIS (2018) finds that school leaders benefit from, and intensively participate in, continuing professional development activities once they are on the job, they most often than not, lack pre-service training on leadership specific

skills before to taking up their duties (OECD, 2019). Some systems, such as that of the Slovak Republic and Austria, have sought to means of addressing this problem by offering TPD opportunities to aspiring leaders and requesting prospective school principals to engage in part of their training prior to appointment (Nusche et al., 2016; Santiago et al., 2016).

At the same time, leadership training need not have the sole aim of preparing teachers to assume formal school leader roles. Building on a broader conception of leadership (Bierly, Doyle and Smith, 2016), many countries have embraced the value of fostering leadership skills among classroom teachers, to empower them to become leaders of learning and teaching and to use their experience to support others. Education Scotland’s “Professional Learning and Leadership Directorate”, for example, offers dedicated leadership programs targeted at all teachers (Education Scotland, 2020).

Access: How accessible is TPD to teachers? (Dimension 2)

Many teachers and school heads report barriers and constraints that prevent them from engaging in collaborative or self-directed TPD programs and from accessing other learning opportunities provided by external actors. This dimension strictly evaluates where these barriers and setbacks arise from, as well as the policies that can enable schools and teachers to overcome the setbacks. The analysis covers, among other issues, (1) which entitlements and specific requirements exist around teachers’ engagement in TPD, (2) the barriers that teachers face, for example due to time or resource constraints, and finally (3) the policies that can help alleviate these barriers and ensure that all teachers have adequate access to professional development opportunities adapted to their professional needs and local working conditions. The analysis investigates both the quality and quantity of the learning opportunities available to teachers within their context, schools and other social institutions, and whether the right conditions are in place for teachers to have access to the types of professional development that are most effective and relevant to their professional needs. This dimension also considers how the funding of TPD can exacerbate or alleviate existing inequities in access and what specific policies can ensure that teachers can engage in high-quality TPD programs, regardless of their location, school size, or backgrounds. Finally, the dimension investigates into how classroom teachers are guided and supported in their engagement in professional development and in their search to access TPD programs that

matches their personal professional needs, as well as those identified by school systems and the wider education system.

The essential questions to be addressed in this dimension include:

- How can systems design TPD entitlements/requirements to support and steer access to learning opportunities for school teachers at different career stages and in different working environment?
- How can systems diversify access to TPD opportunities, so that various schools and teachers have the possibility to choose learning opportunities relevant to their professional development desires and needs?
- What policies orientations can help teachers to overcome financial and time constraints that hampers their engagement in collaborative learning or access to continuous training opportunities?
- What policies can ensure that geographically and socially disadvantaged schools have the capacity, material and financial resources to let their teachers access high-quality PD programs?
- What specific guidance and information can support teachers in navigating the TPD offer to access the most relevant opportunities for training?
- How can school and educational systems use ICT and online learning platforms to support teachers' access to TPD and ensure their meaningful engagement?

Examples of policy issues and questions for analysis (Dimension 2: Access)

Lifting barriers that inhibit individual teachers' engagement in TPD

Alongside a perceived lack of incentives and prohibitive participation costs in TPD programs, conflicts in schedules and a lack of time are the most reported hindrances to TPD participation (OECD, 2019). Creating time for TPD in teachers' schedules is an important precondition for promoting their engagement in both informal and formal forms of professional development. Not all educational and school systems ensure that teachers have sufficient or even dedicate some time to engage in professional development and as such, self-directed learning often take place during teachers' free time. In addition, some schools may experience challenges in accessing substitute teachers to permit main teaching staff to leave their classrooms for professional

development programs EDU/WKP (2020). Even where the teachers may be formally entitled to a given amount of TPD. At the same time, creating sufficient time in teachers' work schedules will not be sufficient enough to enhance collaborative professional development practices, since it needs to be accompanied by teacher leadership, supportive structures, protocols and attention to school culture (Charner-Laird et al., 2017; Kraft and Papay, 2014).

Barriers to access TPD programs may be more pronounced for some teachers than for others. For instance, supports and entitlements may be more restricted for teachers on non-permanent contract types or for those working as substitute teachers. Likewise, time scheduling and constraints difficulties may be particularly serious for teachers working on a part-time basis or under flexible working conditions, thus reducing the amount or quality of their learning and training opportunities. This worrying pattern holds not only in the profession of teaching. Across the EU countries, only 19% of part-time employees working 11-20 hours reported have access to opportunities for training in 2005 (compared to the 28% of full-time employees) and only 10% of those working less than 10 hours reportedly have access. The same pattern holds for employees' perceived opportunity to learn something new at work (Sandor, 2011). This lack of professional development opportunities associated with part-time jobs can create a dynamic of entrapment in the longer term (OECD, 2017). Since teachers' engagement in part-time work or flexible working conditions at some point in their career is the norm in many countries and at some educational levels, ensuring that TPD opportunities are available to all teachers is a very essential policy priority.

Overcoming school-level inequities in TPD

Access Schools vary with respect to the learning needs of teachers but also their resources and capacity to support TPD activities that foster teachers' professional growth. There is however, some evidence to suggest that teachers in high-performing schools benefit from greater support systems and capacity for active and collaborative professional development than teachers in poorly performing schools (Darleen Opfer and Pedder, 2011). In the same light, not all schools have the facilities necessary for teachers to engage in collaboration during the school day and those with staff shortages or excessive teacher turnover may face additional difficulties in providing their teachers with the time and continuity to engage in sustained, effective and collaborative peer learning. Likewise, schools serving disadvantaged student population and in

some other countries, those in rural areas often have teachers who are less experienced may have greater professional development needs (Echazarra and Radinger, 2019). Geographic inequalities in the access or proximity to professional training can reinforce these challenges. Inequalities in schools' access to high-quality TPD programs can exacerbate the existing discrepancies in the quality of teaching, with damaging consequences for the learning outcomes to students in disadvantaged schools. System-level policies can play an essential role in identifying and addressing some of the sources of these inequalities. Needs-based funding systems, for instance, may be developed to ensure that all schools have the existing capacity, financial and material resources, to support their teachers' engagement in high-quality TPD responding to their professional development needs. However, external learning consultants or targeted training to strengthen principals' pedagogical leadership can be used to similar manner. Authorities can also support networks of schools to collaborate on Teacher Professional Development programs or even share relevant resources to increase their collective capacity and provide teachers with high quality opportunities for professional development and exchange. There is a risk that performance accountability systems and management that target failing schools can lead to a systematic narrowing rather than an expansion of their professional development culture if not well put in place (Darleen Opfer and Pedder, 2011). Finally, new technologies, such as online or blended learning and digital platforms to enhance professional development, where appropriately used, can help teachers with limited access to or opportunities for face-to-face TPD interactions with peers.

Designing effective funding mechanisms for TPD

Although an increasingly wide range of opportunities for teachers' self-directed professional learning is accessible online and available for free, some of the most effective forms of professional development are resource-intensive and require substantial investment of resources. School systems however need to devise sufficient funding mechanisms to raise and allocate human and material resources for TPD programs. Such is particularly relevant since a great proportion of teachers describe funding as a hindrance to their professional development (OECD, 2019). It is also essential to note that teachers' engagement in professional development programs may encounter both direct costs (like the cost of learning materials or course participation fees) as well as indirect costs in the form of time spent on PD out of paid hours of

working. Many educational and school systems are moving towards the use of web-based platforms as a means to lower teachers' costs in participating in TPD. However, when teachers use web-based learning platforms to engage in PD programs outside of their paid hours of work, system costs are passed on to individual teachers. Teachers' engagement in TPD programs out of their paid working hours is not free, however, and it is essential to consider the costs of teachers' engagement in TPD programs, whether it takes place within or out of their usual working hours. Within around half of OECD and partner countries with available data, teachers are entitled to paid leave for their absence during TPD programs imposed by the school or educational system. Similarly, all countries reported that the cost of teachers' mandatory professional development at the lower secondary level is either fully subsidized or shared by the government or partially subsidized. Nevertheless, the mechanisms that schools and educational systems use to fund teachers' professional development activities vary considerably (OECD, 2014). In some countries, for instance, funding for teachers' professional development is included in staff expenditure block grants with a high level of spending control at the local level. Teachers in some systems without earmarked TPD funding have reported difficulties in accessing necessary resources for their professional development (OECD, 2017). Similarly, most systems expect teachers to meet up with some of the cost of non-compulsory professional development (OECD, 2014) and public financial support may be restricted to specific types of TPD, or those offered by officially recognized authorities. In contrast to attendance of courses, conferences and workshops, for instance, teachers are more frequently required to pay partially or the full cost for participating in qualification programs (OECD, 2016). Authorities at diverse levels of administration may be involved in decisions concerning the allocation of TPD resources (OECD, 2018) and policy makers need to be mindful of the potential inequalities that can arise at both the teacher and the school level, as well as possible unintended consequences that funding conditions may cause on teachers' PD engagement. Supporting teachers in navigating the TPD offer to access the most relevant training, TPD systems must ensure that each teacher can engage in professional learning opportunities that correspond to their professional growth needs and contribute to their professional growth. This requires systems to individualize the TPD offer, but also support teachers in searching for the right PD program for their professional learning needs. There are a variety of mechanisms for doing so, for instance, by linking the choice of TPD to their ongoing appraisal process. Ensuring that classroom teachers and school leaders have

sufficient information on the formal professional development activities on offer is also very essential, particularly where the teachers are expected to make autonomous decisions on which non-compulsory or compulsory professional learning opportunities to pursue. In 2013, almost all OECD and partner countries reported that school management plays a significant role in disseminating information about professional development activities and, in around two-thirds of countries, central or state education authorities play a role in the dissemination process (OECD, 2014).

Enhancing accessibility while ensuring the quality of TPD

Swift technological advancements in ICT and availability of high-speed internet connections have encouraged the use of online learning platforms for teachers to engage in their professional development. TPD using online learning platforms has a significant advantage in crumbling the constraints of time and place for teachers to access PD programs. It also permits teacher interact across different schools, without geographical hindrances, which is particularly important for teachers of minor subjects. In this regard, online learning platform are an attractive option for many educational and school systems as they can offer significant savings in terms of travel venues, costs, substitute teachers and other expenditures. Having an online TPD program may increase teachers' accessibility to PD opportunities and materials, however better accessibility has no guarantee of quality. Existing literature on TPD based on online teacher collaboration has been largely limited to practices involving facilitated collaboration. Many of them, in fact, researchers have involved in facilitating the collaboration (Coughlin and Kajder, 2009). However, some of the practices observed in teachers' online professional development communities have been seriously criticized for the significant limited room for teachers' engagement and dialogue in the in the process of knowledge-construction (Brown and Munger, 2010), and their credible potential to lead to a "deprofessionalisation" of teaching (Seo & Han, 2013).

Provision: How and by whom is TPD provided? (Dimension 3)

This dimension looks into the ways in which TPD is provided in different schools and educational systems, including the role of the teachers in its delivery and their level of involvement in designing and shaping TPD activities. It considers teachers both as recipients and as providers of TPD programs, both individually (like as coaches, mentors and team teachers)

and collectively (like through network of professional unions and associations). This analysis focuses on both the provision of formal professional development program and the process of understanding and supporting effective TPD activities that are led by school-level activists and practiced in informal and/or private spaces. The means through which teachers engage in professional development – its format, setting, frequency and providers (including the level of their quality or training) – has a significant impact on teacher development and learning. A central question for school and educational systems is how they can systematically re-orient and extend their TPD systems to support teachers to involvement in the types of provision that meet both teacher needs and the system goals. The dimension analyses the different actors involved in providing TPD, the terms on which they engage in its existing provision and the co-ordination between them. It also examines different informal and formal strategies of engaging in TPD in schools and in private settings – interact, how they can be adequately combined and how teachers can be supported in drawing on the full continuum of activities to ensuring their continuous professional growth. Relevant questions to be addressed in this dimension include:

- How can the different forms of TPD provision be supported at different levels?
- How can the format, timing and duration of TPD activities be adapted to support the different learning goals and content types most effectively?
- What existing structures can facilitate teachers' engagement in collaborative or individual TPD practices within, out and between schools, in both formal and informal settings?
- How can schools and educational systems ensure sufficient capacity for the provision of relevant learning opportunities, including the training and supply of teacher educators?
- What rules should govern different TPD providers' engagement in the market for teacher training?

Examples of policy issues and questions for analysis (Dimension 3: Provision)

Reorienting provision towards school-based, collaborative TPD formats Traditionally, professional development offered by public education authorities, teacher education institutions and other tertiary education institutions, professional organizations or private and non-governmental providers has often taken the form of single or short series of externally provided

learning courses. Many stakeholders have questioned and expressed concerns about the effectiveness of these types of provision in influencing teachers' professional learning and development (Garet et al., 2001; Stecher et al., 2018). Findings from the OECD's TALIS survey and the research literature concur to suggest that collaborative and school-based forms of professional development have more significant effects on student achievement and teaching practices (Stoll et al., 2006). Training with peers from different subjects areas can lead to a stimulating exchange of groups and perspectives that include both inexperienced and experienced teachers facilitate the intergenerational transmission of teachers' pedagogical knowledge. This includes not only the mentoring of inexperienced teachers by other experienced peers, but also young teachers sharing new ideas and methods acquired during their initial teacher training with senior colleagues (Geeraerts, Vanhoof and Van den Bossche, 2016). Nevertheless, participation in activities like peer/self-observation, networking and coaching has remained comparatively low. Among the countries participating in the TALIS 2018 research, only 40% of teachers participated in training based on peer networking and learning, compared to participation rates of over 70% in out-of-school sorts of training, such as courses or seminars (OECD, 2019). In addition, although teachers play a significant role in initiating, collectively shaping and providing collaborative learning privileges to their colleagues, many educational and school systems fail to recognize and support the role of teachers in this process. This often results in a lack of supports to facilitate their engagement in continuous, collaborative TPD practices within and across schools. The OECD school systems have pursued a range of different strategies to promote and support teachers' involvement in collaborative TPD programs, as well as the participation of teachers in networks within or beyond the level of their school, which are increasingly being recognized as an important location for self-directed collaborative TPD strategy (European Commission, 2017). Given the enormous variety of forms that these collaborative networks can take (blended, online, offline, cross-border or local networks), it is likely that different methods are needed to support them. Enhancing collaborative learning using system-level policies will also need authorities to consider the necessary supports that need to be put in place for the effective design and implementation and evaluation of TPD programs at the school level. It is worth noting that local initiatives and actors are often best placed to ensure that the focus of their training is responding to identified needs of the teachers and takes account of the context of each school. However, in some systems, like the French Community of Belgium and Chile,

educational authorities have sought to encourage collaborative work within the schools by urging them to develop effective strategies on teacher collaboration as part of their respective school development plans (Santiago et al.; International Relations Directorate of the Federation Wallonia-Brussels, 2016).

Other systems, such as Ontario, Canada, have developed large-scale approaches to facilitate effective collaboration within and between schools by codifying such practices through protocols and technical support (OECD, 2019). Other strategies may also include investments in personnel at the school-level with responsibilities to promote and develop team spirit opportunities. Recognizing the participation of teachers in informal and or non-traditional (such as counting towards the necessary Professional Development duration), can be another way of encouraging the participation of teachers in Teacher Professional Development practices and lend recognition to their demonstrated efforts. In Iceland, for instance, educational administrators are now legally recognizing the participation of teachers in the education enterprise, which offers a wide series of social media-based teacher activities that bring together educational experts, educational administrators, policy formulators, the school community and other educational stakeholders working in a communities of practice, both remotely through online platforms and in physical spaces (Vuorikari, 2019). By scaling and sustaining progressive models of TPD, Education systems therefore will have an interest in promoting school or teacher-driven initiatives as a measure to develop real effective models of promoting TPD that are responding to local realities, contexts and needs, as well as in identifying and promoting good practices and progressive ideas. Researchers have indicated the possible bottlenecks involved in such efforts to legalise and promote successful practices and the possible dangers of large-scale standardised changes displacing locally initiated innovation (Giles and Hargreaves, 2006).

Some models of TPD, like intensive peer coaching, have been proven to be difficult to promote. A recent meta-analysis of 62 research works through the use of causal models to find out the effects of peer coaching on teachers' teaching practice and students' learning outcomes indicates an improvement on the order of 0.49 standard deviations on teaching and 0.18 standard deviations on students' achievement (Kraft, Blazar and Hogan, 2018). However, the advantages of coaching were significantly reduced in larger programs serving more than 100 educators at a time (Kraft, Blazar and Hogan, 2018). Many explanations may arise for this variation across

coaching program size. One of such problems is that educators buy in and possible motivation to engage in peer coaching programs may seem more difficult to sustain the moment it expands beyond a self-selected group of teachers or schools who are motivated, for example, by making participation compulsory or providing strong motivations, which may diminish their effectiveness. Another difficulty in scaling up effective peer coaching programs is to look for high-quality coaches for a large numbers of educators. The selection and preparation of TPD trainers and teacher trainers can make up a significant bottleneck for offering high-quality learning opportunities, most especially in new and emerging fields of study, as well as in geographical areas with less developed school infrastructure for professional learning (OECD, 2019). Administering the market for TPD providers, different TPD providers are engaged in supporting teachers' professional development. The market for official off-site TPD is notably diverse and varies markedly across educational system. In a majority of the 34 OECD and partner states with available data for 2013, teachers' professional development for lower secondary school educators was offered by both school institutions (higher education, specialised initial teacher education institutions and schools) and commercial providers in the field. In about 2/3 of the countries, government agencies for teachers' professional development, teachers' professional organizations, teacher trade unions and local educational administrators also assist in providing teacher professional development, and in about a quarter of the OECD partnering countries, Inspectorates of education also played a significant role in the provision of teacher professional development (OECD, 2014).

Many nations see an increasingly variation set of TPD providers, including third-party providers, competing for government funding and teachers' resources (or, at least, for their limited time). In many other cases, educators are drawing on a wide range of sources to access content that support them in their strife for self-directed learning, including web based educational resources, discussion forums, educative videos, other traditional formats (such as guidebooks) and commercialised training services. Similarly, schools may also face an increasingly extensive and difficult-to-navigate array of training opportunities to support teachers in school-based TPD practices. A government agency with limited capacity or seeking increased efficiency and innovation may partner with a third party, formally endorse their activities, or more generally encourage market dynamics in her TPD offering. If effectively implemented, this could enable school systems to respond more effectively to changing professional development needs,

especially regarding emerging issues (Vuorikari, 2019). To ensure that education providers and programs meet minimum quality requirements, countries can develop certification mechanisms and labels that demonstrate their quality and help teachers and schools make informed decisions about investing in education (OECD, 2019). In some countries, a program's license or provider's accreditation also serves as a means of determining whether to formally recognize a training opportunity or fund teacher participation. Such licensing or certification schemes can be developed in close collaboration with professional associations of teachers and other stakeholders.

How is TPD content selected and developed? (Dimension 4)

As learning goals and student needs change, school systems must ensure that TPD content is appropriate and responsive to the needs of teachers, schools, and the system as a whole. This aspect therefore addresses the development and selection of TPD content and the mechanisms for adapting it to the learning needs of different stakeholders. Specifically, this dimension examines the process by which training and learning needs across education, schools, and systems are identified or predicted and translated into appropriate development activities. Some learning needs arise from system-wide processes (e.g., curriculum reform and other policies that impose new demands on teachers), while others are identified by teachers themselves and arise from their specific professional backgrounds and practices. Therefore, this dimension examines how various stakeholders are involved in the co-creation of her TPD content and how they balance learning objectives arising at the system or school level with the teacher's personal learning interests. The dimension also considers how system-wide training content can be aligned (and the role, e.g. of professional standards and competence frameworks in this process) to ensure their internal consistency and their complementarity with TPD needs. While the central development of learning content is an effective means to mobilise research capacity, respond to central directives and generate efficiencies, drawing on the richness of teachers' local knowledge and practices is critical for any successful TPD system. This dimension therefore seeks to investigate different strategies to codify and mobilise effective teaching practices and how the tacit knowledge that emerges from teachers' professional experience can benefit professional learning in the wider teaching community. This includes a range of processes and actors to identify effective practices and determine their generalisability or the particular school contexts and communities in which

they are applicable. While causal research designs on the effectiveness of teaching practices are costly and time-intensive, an intermediate level of evidence may consist of collecting insights from multiple teachers and schools (OECD, 2019). In this context, this study explores the availability of systems for sharing professional learning content within and across schools and whether they support teacher collaboration across different levels and disciplines. There are also questions about how teachers are supported in interpreting the content of the TPD, relating it to their context, and applying it to their teaching. Related questions that should be addressed in this dimension include:

- How to identify and anticipate emerging professional learning needs at different levels of the system and which actors/stakeholders should be involved in the process?
- What are the mechanisms by which the content of the TPD service can be managed to ensure that her TPD service adapts to these changing needs?
- What role can TPD provisions play in codifying and disseminating teachers' tacit knowledge?
- How can teachers be supported in incorporating and applying TPD content into their teaching?

Examples of policy issues and questions for analysis (Dimension 4:)

Anticipating and Identifying TPD Needs at Different Levels of the System Identifying teacher training needs is an important prerequisite for designing relevant training opportunities to support teachers' professional learning activities (Opfer and Pedder, 201). In the TALIS 2018 survey, teachers reported a significant increase in training needs, especially in teaching students with special needs, using ICT, and teaching in multicultural or multilingual environments. Both participation rates and training needs in these areas are reported to have increased over the past five years (OECD, 2019). Further evidence suggests that these training needs are not evenly distributed among teachers. For example, a 2013 TALIS survey suggested that teachers working with SEN students expressed a particularly high need for CPL (Cooc, 2018). Such training needs can arise for a variety of reasons, including changing student needs, technological innovation, changes in early teacher education, and educational reforms. Many OECD countries have also recognized the importance of promoting the acquisition of “21st century skills” by students, which will require changes in many areas of the education system, including teacher training and professional development (Guerriero, 2017). Various mechanisms help the school system identify emerging development needs, respond to them effectively, and feed them into the development of

her CPL offering across all levels of the system by various actors. Some systems use sector-wide Training Needs Analysis (TNA) to identify teacher knowledge and skills gaps that TPDs are trying to address (The Education and Training Foundation, 2018), or conduct teacher surveys for this purpose (Vuorikari, 2019). As many educational reforms (such as inclusion policies and curriculum reforms) impose new demands on teachers, the design of individualized learning opportunities associated with their implementation can be a key factor in their success (Vuorikari, 2019). Adapting TPD Content to the Needs of Different Stakeholders To ensure that teacher learning supports professional development, TPD content should address teacher training needs identified externally in line with the objectives of the system and personal learning interests.

To guide the development of formal TPD offerings in this direction, effective channels are needed to communicate the needs of teachers, schools and systems to the stakeholders and institutions responsible for developing and delivering formal education. Some education systems guide the development of TPD offerings by aligning funding decisions with national development priorities. Some support school-based development initiatives to achieve better alignment of TPD content with the immediate needs of teachers and schools, with a greater emphasis on learning opportunities developed by teachers for teachers. For example, Columbia recently launched a “Teaching Excellence Scholarships” program. The program supports the further education of teachers and encourages them to develop and implement improvement projects that focus on teaching practices in their schools (Radinger et al., 2018). The autonomy that both schools and teachers have in deciding what professional learning content to seek (or to develop their own) will limit the system's ability to tailor learning opportunities to the needs of teachers. is another important factor in shaping (OECD, 2014).

Building links between Initial Teacher Education (ITE) and in-service teacher education Although ITE and TPD have historically been considered and developed independently, a body of research has shown that they are part of a continuum of professional education for teachers. There is a need for a stronger link between the development of as a While this remains the exception rather than the norm, some countries work hard to ensure that the ITP, induction program and TPD curricula are consistent, well linked and complementary. This holistic approach to teacher education may require a system to systematically build or strengthen relationships between relevant parties. This can include the establishment of consultation

processes, feedback loops between relevant stakeholders and if these responsibilities are shared across several entities, collaboration between the different actors and stakeholders of initial teacher preparation and continuing professional learning systems (OECD, 2019).

However, there may be limits to the extent to which TPD can build on the skills and knowledge acquired in initial teacher education, since not all teachers can be assumed to have received the same ITE (due to changes in the content and structure of ITE over time, or due to alternative teacher preparation pathways). In these cases, TPD may also need to serve as a means to take stock of what teachers already know and do and close knowledge gaps if necessary. The alignment between TPD and ITP therefore needs to be flexible and differentiated to account for variation in teachers' ITE experience and prior knowledge (OECD, 2019). Codifying and disseminating teachers' knowledge through TPD It is important for schools and school systems to codify the knowledge they gain about quality teaching practices in order to enable educators to retain and build on this knowledge base, even when staff transitions occur (OECD, 2019). Continuous professional learning plays a key role in the system's ability to support the internal and external development of teachers' knowledge. TPD activities can help any teacher to “clarify their beliefs, ideas and practices” (Cordingley, 2008). To systematize tacit knowledge at the same time, TPD practices can promote effective teaching practices by leveraging knowledge bases that practitioners can actively contribute to along with the research community and other stakeholders. Research results on how students learn and teach therefore become part of a dynamic knowledge base indicates that information is communicated to teachers and co-constructed by them through individual and group learning (Guerriero, 2017). Strengthening the TPD s role in codifying and disseminating teacher knowledge requires strong links and ongoing exchanges between teachers and their professional bodies, research communities and teacher education institutions (OECD, 2019). It may also include the use of knowledge brokers (in the form of educational advice networks and so on) to facilitate this exchange, and her ICT platform that allows teachers to organize their knowledge and disseminate it throughout the school. For example, in Austria, the Federal Ministry of Education promotes learning in new secondary schools through the Federal Center for Learning Schools. The center will provide a virtual networking and learning space to connect teacher leaders and enable them to share knowledge and expertise in the areas of curriculum and instructional development (Nusche et al., 2016).

How is the quality of TPD ensured? (Dimension 5)

This aspect concerns how educational authorities, schools and teachers can assess and improve the quality of TPD. Ensuring the quality of professional learning is critical to maximizing the use of available resources. However, given the diversity of TPD goals, attitudes, providers, actors, and formats, this presents many challenges such as.

(1) How different providers and actors of TPD systems define the goals and desired quality of professional learning activities.

(2) How the results of TPD activities will be measured and evaluated; and

(3) On this basis, how political approaches and instruments are developed to improve the TPD system. For example, this dimension examines how quality TPD policies and standards are developed across different vendors and stakeholders for different types of deployments and applied at different levels of the system. This includes the use of accountability and quality assurance mechanisms such as accreditation of external providers and evaluation of programs, materials and school efforts. The TPD study also explores how external quality assurance mechanisms are linked to individual, school and system-wide (self) assessment and improvement plans. A key issue to consider in this context is the balance between reliance on external accountability and professional self-regulation, and between focusing on outcomes and considering learning input. Related questions that should be addressed in this dimension include:

- What are the parameters used to measure the purpose of TPD and its effectiveness?
- How can various stakeholders contribute to setting these goals, identifying parameters, and assessing CPL quality?
- How can TPD practices be integrated into a culture of continuous growth at teachers, schools and other levels?
- What is the best system for monitoring the quality of her TPD of various types, including newer formats such as MOOCs (also great for a teacher to monitor her voluntary PD)?
- What accountability structure should exist for teachers (eg, assessment), schools (eg, testing), and external providers (eg, accreditation) for TPD?

Examples of policy issues and questions for analysis (Dimension 5: Quality)

Developing standards for high-quality TPD to have the desired impact on classroom practice and student learning, it must be of high quality, regardless of the format or setting in which it takes place. In some OECD countries, central teacher training institutions manage their TPD delivery,

maintain supervision, and play an important role in ensuring quality through delivery coordination and accreditation. However, in various systems there is uncertainty about the quality of professional learning offers and the processes to ensure them. In some cases, these challenges are exacerbated by the distributed development of learning content and the highly fragmented landscape of TPD providers.

Working closely with schools and other stakeholders, particularly teachers themselves, to develop standards for quality professional learning can be an effective way to guide the development of TPD practice and coordinate various quality assurance tools to ensure the quality of TPD from teacher improvement. Nevertheless, the use of standards for professional learning is not as common as, for example, ITE (Révai, 2018). Given the wide variety of TPD practices, an effective standard must not only address different desired outcomes, but also apply meaningfully to different forms of his TPD engagement, including newer forms such as MOOCs. Not all forms of professional development lend themselves equally well to standards-based approaches. However, the teacher's self-directed learning can also be supported by guidelines and tools that help the teacher assess the quality of the learning process, monitor progress, and ultimately improve the effectiveness of her self-directed TPD. For example, professional standards help teachers identify learning needs and provide reference points to measure progress.

The utilization of the national framework for quality professional study is used in Australia. Australia provides a model for the widespread application of professional standards to promote quality professional learning for teachers and thereby improve student learning outcomes. Australia has developed the Australian Professional Standards for Teachers (the 'Standards') which publicly state what quality education is and what teachers should know and be able to do at different stages of their careers. Developed by the Australian Institute of Educational and School Leadership (AITSL), the Standards are a nationally agreed quality assurance mechanism designed to provide a common understanding and language among teachers, schools, teacher educators and the public across Australia. As Australia operates under the federal model, responsibility for education lies between the federal government and the states/territories. Therefore, not all states and territories use formal accreditation standards for teacher professional education. However, the standard is linked to teacher registration requirements across Australia

and helps teachers commit to professional learning in line with the quality and common standards set out in the standard.

Australia also invested in exploring approaches to measure teacher impact on student learning and attainment, as well as the use of such measurement tools to improve teacher practice. To provide a framework for teacher assessment tools, the University of Melbourne, for example, has investigated key characteristics of effective teachers and teaching. This research provides references for school systems, leaders and teachers as well as the broader educational research community, to assist the development of policies and systems that support teachers to identify ways to continually improve their practice and impact. With the aim to promote excellence in the teaching profession and school leadership, the Australian government funded AITSL to develop and test practical applications of these findings so that teachers are well supported to determine their proficiency against the Standards and identify areas for improvement. AITSL has also developed national policies to support the high-quality professional learning of teachers, including the Australian Charter for the Professional Learning of Teachers and School Leaders (the Charter) and the Australian Teacher Performance and Development Framework (the Framework). This charter defines the characteristics of quality professional education for teachers. This framework supports school leaders in developing a positive performance and development culture in their schools. This charter and framework are designed to enable quality professional learning, improve education, and help create conditions that benefit students. AITSL also provides online resources to enable teachers to deliver high-quality professional learning that is both standard and tailored to individual teacher needs. For example, AITSL has launched an online teacher self-assessment tool that allows teachers to review their practice against standards and receive personalized feedback using her 30-minute questionnaire. The tool can be used for informal purposes such as self-reflection, identifying strengths and areas for progress, professional study planning, or setting career goals. It can also be used as part of formal processes, such as performance and development goal-setting, performance reviews and certification at Highly Accomplished and Lead Teacher levels of the Standards. More recently, AITSL has published the 'Improving teacher professional learning' webpage, which includes a suite of resources supporting the central 'High-Quality Professional Learning cycle.' The cycle defines a process through which teachers can identify their learning needs, select and undertake professional learning, apply it in their context, and evaluate its impact. Resources supporting

implementation of the cycle include practical guides, video case studies and research reports underpinning the evidence for AITSL's work in the teacher professional learning space. Today, AITSL works in collaboration with states and territories to scope and develop an online community for teachers where teachers can learn from each other by drawing on quality resources. Furthermore, under the COVID-19 pandemic, AITSL also provided a best practice evidence guide for teachers to learn how to set up online learning and what advice to offer to students and parents learning from home. Quality assurance in Norway's decentralized in-service development model in 2017, Norway introduced a new model for in-service teacher development. It focuses on regional analysis of training needs and collective forms of professional learning. National authorities are providing financial support to teachers involved in qualification training on priority subjects and to local governments organizing collective in-service training. New model puts local "school owners" in charge of identifying teacher skills creation of a professional study plan in collaboration with development needs and local universities. These plans are then discussed at a stakeholder "collaboration forum" (local colleges, community associations, teacher representatives, local businesses) convened by county-level governors. Once training priorities are agreed, county governors allocate funds to local governments. This decentralized system is complemented by a follow-up program that provides government assistance and advice to local and county officials reporting poor performance in key areas of education and training. His third pillar of this model is an innovation program that brings together local authorities and the research community to develop and test learning interventions according to the evaluation and quality requirements set by the country. To assess and improve the effectiveness of decentralized professional learning initiatives, the Norwegian Directorate General for Education and Training has developed five quality criteria to guide discussions with providers and stakeholders duration and opportunity for active learning. Consistency with teacher knowledge, beliefs and educational policies, opportunities for shared learning and focus on knowledge of subject matter and educational content. The district governor prepares an annual report and the board conducts a survey of school owners, principals and teachers to gather information on their involvement in professional development. This information is supplemented by data on student learning outcomes and surveys of learning experiences, which schools can use to assess the professional learning needs of teachers. Additionally, the Directorate General

commissioned an external assessment to assess the impact of the new skill development model (Australian Institute of Education and School Leadership; 2011, Melbourne & Levi, 2018).

Monitoring TPD regulations and provider quality can then be a daunting task. Many countries lack robust systems to track a teacher's engagement with their TPD, much or less analyzed quality and impact (Darling-Hammond, Hyler and Gardner, 2017; Shewbridge et al., 2016). Nonetheless, efforts to monitor the effectiveness of TPD can make an important contribution to improving the quality of teachers' professional learning. Effective monitoring mechanisms assess whether teachers' learning needs are being met, strengthen provider accountability, and enable teachers, school leaders, and others to select the appropriate form of TPD to meet their needs. A key prerequisite for monitoring the quality of teacher professional learning is strong communication channels and feedback loops between stakeholders such as teacher education institutions and teacher professional associations. Another challenge in monitoring the effectiveness of TPD is defining an appropriate set of parameters for evaluating its success, given its variety of forms and wide range of potentially desired outcomes. Many evaluations of TPD programs focus on student improvement on standardized tests as a primary indicator of effectiveness (Darling Hammond, Hyler, & Gardner, 2017). The scope may be too narrow to capture its impact.

It includes not only the outcomes of other students, but also teachers' beliefs, attitudes and other desirable influences on teaching practice (Vuorikari, 2019). Similarly, many informal forms of professional learning, such as teacher-led learning, participation in professional learning communities (PLCs), and feedback from peers, currently cannot be systematically assessed for effectiveness and may require alternative teacher-led monitoring techniques. By supporting teacher self-assessment practices. Integrating TPD practices into school- and system-level improvement processes Professional development of teachers is closely linked to improvement of the schools in which they work and improvement of the system as a whole. Integrating TPD practices into improvement plans at teacher, school and other levels ensures that teacher learning practices are influenced not only by the needs of the school and the wider system, but also by individual needs (OECD, 2013). It also empowers colleagues to work together on common goals and actively contribute to the improvement of the school. Conversely, the explicit inclusion of TPD in school improvement plans ensures that school goal setting is aligned with the

development of embedded learning opportunities that help teachers and leaders acquire the skills and knowledge to reach those goals (OECD, 2019). Although many school systems expect school leaders to develop annual or multi-year strategies to improve student learning outcomes, it is less common for school leaders to develop corresponding professional development plans (OECD, 2016). Such development plans may include additional collaborative hours in teachers' timetables, continuing professional development courses, support networks of schools with similar learning goals, e-learning libraries, and other tools. Establishing Effective Quality Assurance and Accountability Structures for TPD Providers Schemes can use different mechanisms at different levels to hold TPD providers accountable for the quality of their service. Effective accountability structures depend not only on the nature of the TPD services covered, but also on the conditions under which teachers access these learning opportunities. In many countries, the use of public funding for professional learning activities is limited to programs offered by a few organizations (teacher training institutions or professional development institutions). Especially in countries where participation in professional development is mandatory, there may be little incentive for TPD providers to innovate and improve quality unless there are complementary quality assurance mechanisms (such as program or provider accreditation or licensing standards). Other systems rely on open markets for formal professional development activities or encourage teachers to use the services of private providers to promote quality through competition. However, for these mechanisms to work effectively, a teacher or school leader may need to be well informed about the quality of his TPD program, so that certain informed decisions can be made in this regard (OECD, 2014; OECD, 2005).

Similarly, as far as levels of analysis to understand teacher professional learning is concerned, it is important to recognize the interrelationships and complex interactions between actors at all levels that contribute to the process (Opfer & Pedder, 2011). For each aspect of the above five analyses, the TPD research framework considers a three level of analysis:

- A) Teachers – individuals or groups – who can be both recipients and providers of TPD for instance A system that includes the various actors that shape the professional learning of teachers.
- B) Schools, including teaching teams, and Various Levels of School Administrators, Institutions of Higher Education, Teachers' Unions or Professional Associations, and Private Education Providers

C) Teachers through peer coaching, professional learning communities or networks of teachers.

The fore presentation is a detailed account of how policy issues of TPD can be addressed as prescribed by the OECD. It gives a detailed policy recommendation on how to handle policies of TPD in a cross section of five dimensions. These dimensions postulate that teachers must be motivated to pursue TPD programs. According to the OECD dimensions, when teachers lack adequate motivation to follow TPD programs, they will be unwilling to acquire the skills provided by the TPD programs. Thus, the OECD proposes that policies should be formulated introducing incentives like promotion, recognitions and finances should be introduced in order to motivate teachers undertake the TPD programs. Similarly, the OECD proposes that access to TPD programs is very essential. In this light, policies regarding access to TPD programs should be formulated. In formulating such policies, the policies must address concerns like uplifting barriers that hamper teachers from gaining access to TPD programs, overcoming school-based inequalities are within a given country the level at which teachers have access to TPD opportunities varies from region to region. Besides, the OECD proposes that alternative ways beside face-to-face presentations should be introduced when providing TPD programs, thereby suggesting the introduction and utilization of technological platforms in the provision of Teacher Professional Development Programs. Similarly, policies according to the OECD recommendations should address issues related to the funding of TPD projects. This is however because access and the effective utilization of funds in TPD projects is considered very important in the effective execution of TPD projects. The policy should clearly state the sources of the funds as well as how the funds will be utilized. The funds should be used in motivating teachers who attend the TPD programs, buying of materials to be used in implementing the TPD projects and refreshments.

Similarly, the OECD also recommends that policies should be formulated indicating clearly how the content for TPD should be selected and designed. This stems from the fact that the content of the TPD programs is one of the major indicators of the effectiveness of the TPD program. By this it is suggested that the content should be gotten from the teachers' expressed needs based on their professional lapses as well as their aspirations. The content can also be gotten from national vision but in conformity with the expressed needs and aspirations, in which the concept of co-creation of TPD content emerges. Thus, when selecting the content of TPD programs, local

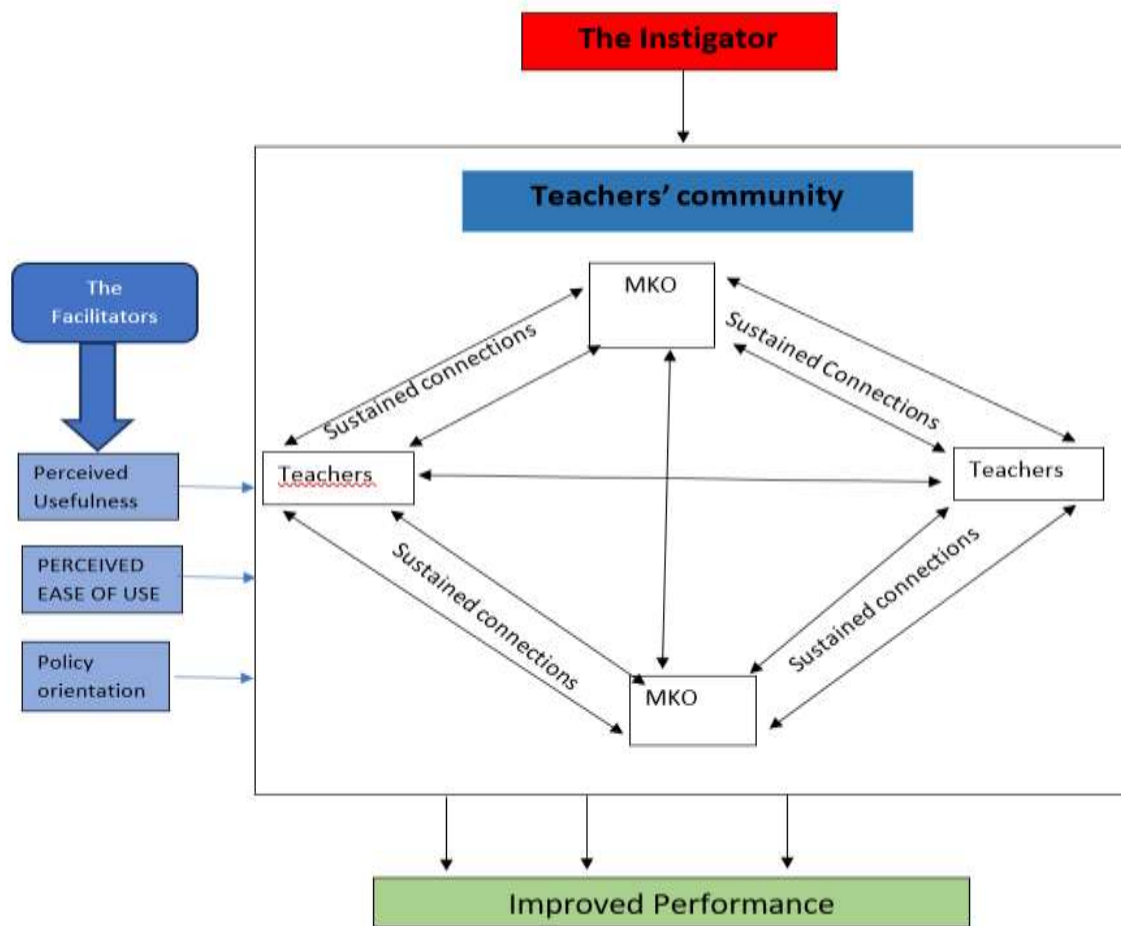
realities of teacher and communities should be taken into consideration when selecting the content.

Finally, the fifth dimension holds that policies should be formulated with clear indications of the quality control measures of the TPD programs. This dimension arises from the fact that not all TPD efforts lend themselves to the desired quality measures. Thus, the policy formulators should clearly spell out the quality measures to be respected in the discharge of TPD programs. In this like the state is sure of the quality of PD that teachers are involved in.

The Interactive Mobile Technology (IMT) Model for Teachers' Professional Development

Galvanizing momentum from the literature reviewed on shortcomings of the one shot model of Teachers' Professional development, coupled with teachers' preferences in the design consideration of a model to enhance their Professional development as well as policy orientations in the integration of technology into the Professional Development procedures of teachers which reflect the first three objectives of this research project, the researcher further drew inspiration from the theories of socio constructivism, connectivism and community of practice as well as major literatures reviewed in this study to proposed the Interactive Mobile Technology (IMT) Model to Enhance Teachers' Professional Development.

Figure 6: Fig The Interactive Mobile Technology (IMT) Model to Enhance Teachers' Professional Development.



The model on figure 6 presents Interactive Mobile Technology (IMT) Model to enhance teachers' professional development. It is an interactive model with core elements functioning together to bring about improved performance of the teaching function by teachers. The core elements in the model are described as follows:

The Instigator

The instigator in the context of this study refers to the major factor that provoked the development of the IMT model which are the weaknesses of the one-shot model to enhance Teachers' Professional Development. Thus, the instigator is the major motive that instigated the researcher to development the IMT model so as to aviate existing weaknesses of the one-shot model in order propose a model which could bring about an improvement to the quality of professional development service delivery to teachers.

Teachers' Community

Teachers' community of in this model refer to a group of practicing teachers who come together with the aim of interacting and learning from each other and improving on their professional service delivery. In teachers' community, there are varied activities aimed at professional development of the teaching profession. In this model, the researcher suggests that teachers should be come together in a community, exchange ideas and help others to improve upon their practice of teaching. In an effective community of practice, relationships are formed through discussions, collaboration, assistance, task distributions and sharing of knowledge.

The activities in a community of practice evolve naturally as teachers engage in mutually benefitting activities aimed at developing each other and growing together in the teaching profession. In a eachers' community, teachers maintain a constant connection with colleagues by sharing texts, audios and videos on recent changes in pedagogy as well as to providing solutions to existing and expressed pedagogic problems. Besides, in the community, there is a wide range of ideas exchanged over a given topic as various supervisors and experienced teachers will be sharing best practices on a given topic in order to enhance the professional development of one another. The content of the community interaction is based on the expressed needs of the member of the Teacher Professional Development community, in order to ensure relevance and usability of the shared information. All these is aimed at helping teachers who are found in their respective zones of proximal development as stipulated by Vygotsky (1978) to gain insight on their professional challenges and move out of their ZPD to higher levels of teaching, thereby rendering quality services to the educational community.

Hagg (1996) suggests that the content of the Teacher Professional development package should be based on the teachers' professional development needs. Jan and Berry (2012) on their part propose that the content of a mobile model to enhance TPD should be based on Technological Pedagogical Content Knowledge (TPACK). On the other hand, Kowalski, Busey, Bates and Belistein (2017) purport that the format of the content should be based on the preference of the teachers given their perceived Ease of Use (PEU) and their Perceived Usefulness (PU) of the preferred technology. Kobarg and Scwidt (2011) hold that formats like audios and videos are mostly preferred by teachers as they can easily access the content to enhance motivation, resonance and help teachers to reflect more critically. Other researchers advocate for the fact that pedagogic videos and audios enhances collaboration amongst the teachers which help them co

construct knowledge (Shulman & Shulman, 2004) and Hagg (1996), a situation which will enhance their perceived usefulness.

As far as the duration of the community practice is concerned, the researcher upholds the idea of Burns (2018) who advocates for the fact that Teacher Professional Development program is a process and not an event which starts and ends. It is continuous and an ongoing process. This is because the teacher needs sufficient time to learn the content of the professional development program as recommended by Hagg (1996). Thus, the activities in the Community of practice should be continuous and ongoing, constantly receiving problems from teachers and seeking lasting solutions to the existing problems. The difficulties from teachers and provision of solutions are done through sustained connections.

Sustained Connections

Sustained Connections is a variable which holds that knowledge is constantly evolving and the teachers need to stay in constant connection with each other and with their colleagues and supervisors (More Knowledgeable Other) in order to constantly update themselves in order to constantly renew their knowledge of the teaching profession. The researcher is thus suggesting that Teacher Professional Development is a process and not an event. So, teachers need to stay in constant connection and keep making modification in their teaching practices and improving on the quality of teaching service delivery.

For more efficiency, the sustained connection should not be limited only to face to face contacts with colleagues and supervisors, it should also be maintained on mobile technological devices, which permits them to ask relevant questions and interact with other colleagues anywhere and at any time. Informed by the theory of connectivism by Siemens and Downes (2005), which is a theory aimed at explaining how learning takes place in the 21st century as postulated by Marquis (2012), the establishment of a sustained connection with what Vygotsky (1978) calls the More Knowledgeable Other who in this case are education supervisors in the teaching profession and even more experienced colleagues, the teacher is able to interact and learn more and newer practices which enables the teacher to improve on the quality of teaching service delivery. Such sustained connections which are maintained in the Teachers' community enables teachers to share their view points on relevant issues on the teaching profession as well as share best practices and experiences.

Maintaining connections in the teachers' community is for self-improvement and a means to improve upon the quality-of-service delivery in the teaching profession. The connections are meant for exchange of professional ideas to improve upon the professional competence of each member in the teachers' community. It is a measure in which teachers get close to each other, guide each other, share professional experiences aimed at professional growth and improvement. Siemens (2004) is of the opinion that connections highlighted in the theory of connectivism seeks to integrate new skills into a body of existing knowledge which serves as a means for professional development. The researcher further posits that such connections can be maintained through a variety of means; through face-to-face contacts as well as through electronic devices. The sustained connections are mentioned already are done between the teachers themselves and most especially with the More Knowledgeable Other (MKO).

The More Knowledgeable Other (MKO)

The more knowledgeable other in the context of this model presented in figure 2.4 refer to education supervisors and even more experienced teachers. As depicted on the forementioned figure, there is a constant interaction between the More Knowledgeable Other (MKO) and the teachers within the teachers' community. The interaction is not limited just between the MKO and the teachers. There is also supposed to be a constant interaction between the teachers themselves. Where they share ideas, best practices and challenges encountered in the discharge of their teaching function.

Out of the teachers' community, there are external factors that influence the workability of the activities carried out. The external factors can foster or hinder the activities of the teachers are referred to as the facilitators.

The Facilitators

These are three sets of components which work together in order to ensure that the activities of the teachers' community are properly done, avoiding a situation where there the activities of the teachers' community could suddenly come to a halt. The facilitators are:

Perceived Usefulness

As highlighted already, the activities taking place in the teachers' community should be carried out both in a face-to-face mode and remotely through the use of technology. In a situation where the activities of the teachers' community is carried out remotely and teachers perceive that the chosen technology is useful in the process, there is a likelihood that they will accept the technology in the TPD process, As purported by Davis (1989), when prospective users of technology perceive that the technology will be useful in the execution of a desired task, the prospective users are prone to accept the piece of technology. In the same vein, in a situation wherein technology is used to foster the Teachers' Professional Development in a Teachers' Community and the actors perceive that the technology will be useful, they will quickly accept the technology.

Opposingly, when teachers perceive that the technology will be of little or no consequence to their professional development journey, they will likely resist the use of the technology, thereby marring the use of technology in enhancing their professional development. Thus, inasmuch as it is highly recommended to help teachers perceive the usefulness of a given technology in the professional development process, it is also incumbent of the actors concerned to help teachers perceive the use of use of the technology.

Perceived ease of use (PEU)

In a situation where technology is used to enhance the activities of the teachers' community, teachers' perceived ease of use of the technology becomes crucial. Where teachers and More Knowledgeable Others (MKO) perceive that the given piece of technology is easy to be used in carrying out the activities of the teachers' community, they can easily accept the piece of technology, thereby fostering the activities of the teachers' community.

Contradictorily, when members of the teachers' community who are the teachers and the More Knowledgeable Other perceive that the technology chosen to foster the activities of the community is difficult or complex to use, they can easily resist the use of the piece of technology in fostering the activities of the teachers' community, thereby hampering the activities of the Teachers' Professional Development.

In order to avert such situation, it is recommended that before introducing teachers to the use of technology in enhancing their professional development, the stakeholders have to take out time to

train the teachers in the functionalities of the technology so as to avoid stress on the part of the users which could culminate to their rejection of the technology when they perceive that it is not easy to use it. Therefore, while helping teachers to easily use a given piece of technology in the professional development process, it is essential for the key actors involved in the TPD process to ensure that the chosen technology and processes that take place in the teachers' community function inline with prescribed policies.

Policy Orientations

As teachers constantly maintain connections during their professional exchanges in a teachers' community, new ideas which can lead to improvement in teaching service delivery are born. Such new ideas cannot be effectively implemented in illegality, thus there is a need for policies to be put in place in order to permit teachers innovate upon their professional practices. As recommended by UNESCO (2011) the policy orientation guiding the integration of technology in the educational process should be under constant review to integrate newer ideas that emerge from scientific development. Besides, the teachers must be included in the policy formulation and development process taking into consideration the actual needs of the teachers and that of the existing society as well as the realities in that take place in the teachers' community. It is for this motive that figure 2.4 of this study depicts that policies are impacting the teachers' community as well as the activities of the teachers' community are impacting the policies by stipulating the content of the policy through experiences gathered within the teachers' community

Once the policies are formulated, the policy makers should ensure that the policies on educational matters are not be static, rather, they should constantly be renewed and improved upon in order to accommodate the recent developments that emerge in teachers' communities of practice and other scientific works.

Developed policies should be that which is aimed at motivating teachers to undertake professional development programs. Such is the case because motivation is crucial in helping teachers undertake professional development courses. Such motivation include; giving them stipends for completing a training package or for attending a given training session as well as promise of promotion to higher positions of responsibilities as a reward for attaining a given level in professional development program.

Improved Teachers' Performance

The improvement in the performance of teachers is the main motive for engaging in a Teacher Professional Development Program. The constant connection maintained by the teachers in the ongoing process in the professional development community, enable teachers to acquire more knowledge on the teaching function and ameliorate their performance in the teaching function. The acquisition of knowledge in the community is self-paced as the teachers will decide when to be in the community and when to watch the shared videos, read the shared texts and listen to the shared audios. This ease of use permits the teacher to learn at his/her peak period in all comfort, thus bringing about quality in the professional development process which is an essential measure in improving the quality-of-service delivery.

Summary of Literature

Chapter two of this study sought to review literature on issues related to teacher professional development. Specifically, literature has been reviewed on the main variables of the study to ascertain the viewpoints of other researchers on the key concepts, in this literature was reviewed on the shortcomings underpinning the one shot workshop model to enhance teacher's professional development; teachers' preference in the design of a Teacher Professional Development through mobile learning and Policy orientations that could foster the implementation of mobile learning within the basic education sub sector. From this review, it can be ascertained that there are a variety of models of teacher professional development. These models can be divided into two. From the two models, literature holds that the traditional models of teacher professional development like one shot seminars are no longer responding to the professional development needs of teachers. Literature has equally suggested that an effective teacher professional development program should be continuous and ongoing over a period of times, as TPD is not an event rather it is a process.

Besides, in the theoretical framework of the study, literature on four theories has been reviewed. Firstly literature was reviewed on the theory of Socio constructivism by Lev Vygotsky which shows how interaction amongst learners help them to construct their own knowledge. The connectivism theory propounded by Downes and Siemens (2005) was also reviewed which explains how internet technology is creating many more opportunities for man to related and interact with others and learn. Moreover, the community of practice theory propounded by

Wegner and Lave (1998) has also been reviewed where it is said that for professionals to enhance their professional development, they need to form a group with a common goal. They will then share ideas, best practices and worries in the community with the aim of learning from each other and growing in their professional practice. Technology Acceptance Model was also reviewed, which explains the variables which could be taken into consideration in order to enable prospective technology users to accept the use of technology in a given walk of life.

At the end of literature review, the researcher proposed the Interactive Mobile Technology (IMT) model to enhance teacher professional development. In the model, three key elements are considered prima viz: Socio-constructivism which is made of three sub elements (MKO, Scaffolding and ZDP). This variable explains the major orientations which should be used in designing an effective TPD content which will be rewarding and motivate teachers in engaging in TPD programs. The second element is community of Practice which describes the sum total of interactions and collaborations which the stakeholders of the TPD program are expected to engage in so as to bring forth an effective learning of the TPD content. The third variable is connections which explains how teachers can constantly stay in touch within their community of practice in order to constantly learn the content designed for the TPD exercise. The fourth element is Policy orientations which explains guiding principles to be put in place by the government in order to ensure the credibility and legality of the use of mobile technology in the education sub sector to enhance TPD. The last variable is improved teachers' performance which is a representation of the end reward of the entire procedures carried out in the IMT model which is that of better execution of the teaching function.

Empirical Review

A study was conducted by Tong, Nguyen and Ngan in 2023 titled using M-learning in teacher education: A systematic Review of demographic details, research methodologies, pre-service teacher outcomes, and advantages and challenge. This study was aimed at conducting a systematic review and present a recent synthesis of the m-learning literature from 2018 to 2023 in teacher education relating to subject publication year, geographic distribution, matter domains, mobile devices and technologies used, research methodologies used to examine the implementation of m-learning, results for pre-service teachers, as well as benefits and challenges of m-learning adoption. The methodology used in the study was the systematic review and the

PRISMA guidelines. The findings show that using mobile learning has a positive impact on how pre-service teachers develop their knowledge, skills, and attitudes. Additionally, adopting this learning style recently in teacher education has certain advantages and challenges, requiring lecturers, pre-service teachers, and institutions to have the necessary equipment for knowledge, skills and facilities to achieve efficiency.

Another study was conducted by Baran (2014) A Review of Research on Mobile Learning in Teacher Education. The study was aimed at addressing trends and gaps observed in the literature regarding the integration of mobile learning into teacher education. The research design used for the study was the qualitative research design whereby the researcher used interview guides to collect data for the study. The data collected were analysed and six main findings emerged as follows: (a) there is an increasing trend in integrating mobile learning in teacher education contexts; (b) theoretical and conceptual perspectives are scarcely reported; (c) variations exist in perceptions, attitudes and usage patterns; (d) engagement with mobile learning and devices is primarily reported as being beneficial; (e) challenges were scarcely reported; and (f) several pedagogical affordances support mobile learning integration into teacher education settings. These findings have been interpreted to determine their implications on the development of mobile learning experiences in teacher education, including programmatic directions for integration and study.

Besides, another study was carried out by Aubusson, Peter, Sandra and Burden (2009) titled Mobile learning for teacher professional learning: benefits, obstacles and issues. The study sought to re-examine teacher use of mobile technologies for their own professional learning. The researchers used the qualitative research design in which they interviewed eight educators, comprising teachers, teacher advisors and teacher developers. To collect data for the study, a semi-structured interview was carried out which focused on participant views of, or experiences with, mobile technologies; the ways in which they are used in professional learning; and current policies, ethical issues and influences that promote or hinder mobile professional learning. The data was analysed by coding, memoing and using the constant comparative method. The analysis was guided by "a ladder of analytical abstraction" to establish an interpretive framework for the phenomenon under study. The findings revealed that despite the benefits and potential learning gains for teacher professionals, the adoption and actual use of mobile technologies by teachers

appears to be unfulfilled at the present moment. Three areas of interest deserve special attention and further investigation which are: 1) the ethics of using mobile devices for professional learning 2) the degree to which most teachers are digitally competent and confident 3) the degree to which the teaching is a reflective profession.

In addition, a similar study was carried out by Barksdale, Upadhyay, and Vernon (2021) titled Teacher professional development: Mobile and limited technology-enhanced pedagogy. The study was carried out with the objective of understanding the influence of technology integrated/supported professional development (PD) on preK-12 grade teachers in Nepal. The study made use of the TPACK framework and sociocultural theory. The study was used the qualitative research design. Data for the study was collected through observations, self-reflective fieldnotes, informal interviews, and artifacts. Data analysis indicated that effective and locally suitable technology integration relies on building relationships with the teachers and school community; technology integration needs to be focused on the local needs of students and teachers based on their resources and curricular demands; and while limited (mobile) technology integration can support better learning, student-centered inquiry based pedagogy needs to guide technology use in class. Furthermore, the study argues that recognizing and valuing local cultural and school contexts are central to successful PD in technology integration.

CHAPTER THREE

METHODOLOGY

Research methodology is a systematic explanation of how a researcher proceeds with a study under consideration (Gauder, 2012). The researcher further holds that research methodology is a collective term for the structured process of conducting a study. Igwenagu (2016) on the other hand holds that research methodology is a set of systematic techniques used in research or a guide on how a research process is conducted. The term research methodology is usually considered to include research design, data gathering and data analysis process. Taking this view point into consideration, in this chapter, the research design used for the study has been described; the population of the study has equally been presented alongside the sampling technique. In the same vein, the data collection process and the instrument used in collecting them have equally been described as well as the procedure used in analyzing the data. It is worth recalling that this study was conducted to answer the following four research questions:

- What are the weaknesses underpinning the one-shot model of teacher professional development in in Cameroon nursery and primary schools?
- What are teachers' preferences in the design of a teacher professional development model through the use of mobile learning?
- Which policy orientations could foster the smooth implementation of mobile learning in Cameroon nursery and primary schools?
- What are nursery and primary school teachers' performances after pursuing a professional development program through mobile learning?

These research questions served as a guiding post sign for the researcher to select appropriate techniques used for data collection and data analysis.

Research Design

Research design can be defined as a structure of a research project or a guide which holds all the elements of a research project together (Akhtar, 2016). It a procedure for collecting, analyzing, interpreting and reporting data collected during a study (Boru, 2018; Akhtar, 2016). Boru (2018) further states that research design sets the procedure on how data shall be collected, the methods

to be applied in the collection and analysis of the data and how all these are to culminate in order to answer the research questions. The principal aim of a research design is to provide appropriate framework for a study (Jilcha, 2019).

The Embedded Mixed Research Design was used for this study in which both qualitative and quantitative data were collected and analyzed. The mixed research design combines elements of qualitative and quantitative approaches for the purpose of understanding the breadth and depth of a study under consideration (Schoonenboom & Johnson, 2017). The researchers further post that the primordial motive for combining qualitative and quantitative research approaches in a mixed research method is to expand and strengthen the conclusion of a study and also to contribute in answering the research questions. Johnson and Christenson (2017) opine that mixed research design ultimately heightens knowledge and validity as the design as a product should be of sufficient quality in order to achieve multiple validity legitimation. Onwegbuzie and Johnson (2006) on their part purport that in combining the qualitative and the quantitative methods, the researcher must ensure that elements of both methods are combined in the study.

Beside the fact that the primary reason for using the mixed research design is to strengthen the conclusion of a study and answering the research question, other reasons can also account for a researcher's motive for using the mixed research method (Schoonenboom & Johnson, 2017). A general classification of the purpose of using the mixed research method was first done in 1989 by Greene, Caracelli, Graham based on analysis of published studies that have used the mixed research design. Though relatively old, Greene (2007) holds that this classification is still in use. Greene et al (1989) presented the following classification of purpose for a mixed research design:

- 1. Triangulation seeks convergence, corroboration, correspondence of results from different methods;*
- 2. Complementarity seeks elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method;*
- 3. Development seeks to use the results from one method to help develop or inform the other method, where development is broadly construed to include sampling and implementation, as well as measurement decisions;*

4. *Initiation seeks the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with questions or results from the other method;*

5. *Expansion seeks to extend the breadth and range of inquiry by using different methods for different inquiry components.*

Based on the nature of this present study titled *The Mobile Model of Teacher Professional Development and Its Efficacy in Enhancing Cameroon Nursery and Primary School Teachers' Professional Development*, was conducted based on the fifth classification which is “*expansion*” will be used, where the breadth and depth of the study will be expanded by using both the quantitative and qualitative methods.

There exist different types of mixed research designs propounded by different authors. Johnson, Christensen and Onwuegbuzie (2017), constructed a set of mixed methods designs with a resulting mixed methods design matrix containing nine designs, which has been labeled by Schoonenboom & Johnson (2017) as follows:

- QUAL + QUAN (equal-status concurrent design),
- QUAL + quan (qualitatively driven concurrent design),
- QUAN + qual (quantitatively driven concurrent design),
- QUAL → QUAN (equal-status sequential design),
- QUAN → QUAL (equal-status sequential design),
- QUAL → quan (qualitatively driven sequential design),
- qual → QUAN (quantitatively driven sequential design),
- QUAN → qual (quantitatively driven sequential design), and
- quan → QUAL (qualitatively driven sequential design).

The above set of nine designs assumed only one qualitative and one quantitative component. However, this simplistic assumption can be relaxed in practice, allowing the reader to construct more complex designs.

Considering the peculiarity of this study under consideration, the QUAN → qual (quantitatively driven sequential design) was adopted for the study.

In carrying out a study using the mixed research design the researcher should go through the following sequential steps as propounded by Caswell (2012):

Step 1: Determine if a mixed methods study is feasible

At this stage, Caswell (2012) suggests that before engaging in a mixed research design, the researcher or researchers must first of all ensure that they have the skills in designing mixed method instruments, time for collecting such an extensive data for a study and knowledge in implementing the different types of designs. Care should also be taken that the targeted audiences will appreciate the complexity of the use of a mixed research design.

Step 2: Identify the Rationale of using a Mixed Research design

At this stage, the researcher must be able to state solid reasons for deciding to use the mixed method research design. This is because the rationale provides a good starting point for carrying out the study and be included in the research plan and report. The rationale should be clearly stated and reported.

Step 3: Identify the Data collection Strategy and Type of design

At this stage the researcher is expected to identify and state the strategy that will be used in collecting data for the study. In the same vein, the researcher should decide the priority to be given to the qualitative and the quantitative data collected. The researcher is also decide the type of qualitative (interviews, observation...) data and the type of quantitative data (test scores, Likert scales...) to be collected.

Step 4: Develop quantitative, qualitative, mixed method research questions

The development of the quantitative, qualitative mixed method questions is the process of developing items to be included in the research instruments. These items might be developed before the study or they might even emerge in the course of conducting the study, depending on the design (Pardede, 2019). The researcher further posits that in a convergent mixed research design, the questions are clearly specified before the administration of the instrument, whereas in two phase sequential design, the questions for the second phase shall emerge as the researcher

moves into the study. Cresswell (2012) suggests that items for mixed methods should always be composed of exploratory and analytic questions. In this study, the quantitative and qualitative questions were developed before the data collection process.

Step 5: Collect Quantitative and Qualitative Data

At this phase the researcher is expected to rigorously collect both quantitative and qualitative data. The sequence of collecting the data will depend on the type of mixed research design implored for the study. For the sake of this study, both qualitative and quantitative data will be collected simultaneously.

Step 6: Analyse data concurrently or separately

Cresswell (2012) purport that in explanatory and exploratory mixed research design, the quantitative and the quantitative data re analysed separately, while in a convergent mixed research design, the two data sets are analysed integratedly.

Step 7: Write the Report

At this phase the researcher is expected to write the research report. The report is usually written either in one phase or two phases, depending on the mixed methods research design chosen for the study.

Area of the Study

This study was carried out in all the ten regions of the republic of Cameroon. The ten regions in which the study was carried out are Adamaoua, Centre, East, Far North, Littoral, North, North West, West, South, South West.

Population and Sample

The target population for this study was made up of all the 129,027 nursery and primary school teachers in the Republic of Cameroon. The 129, 027 teachers constituted 28 680 nursery and 100 347 primary school teachers gotten from all the 30,582 nursery and primary education establishments in the republic of Cameroon (Ministry of Basic Education Statistical Year Book, 2019-2020). The 30,582 schools constituted 10 678 nursery and 19904 primary schools in the republic of Cameroon.

Table 1: Distribution of Nursery schools according to school type and Regions adopted from 2019-2020 MINEDUB statistical year book

<i>REGION</i>	<i>Government</i>	<i>Private</i>	<i>Community</i>	<i>Total</i>
<i>CAMEROON</i>	4142	6198	338	10678
<i>ADAMAWA</i>	124	101	34	259
<i>CENTRE</i>	871	2640	21	3532
<i>EAST</i>	315	165	101	581
<i>EXTREME NORTH</i>	200	66	32	298
<i>LITTORAL</i>	396	2047	25	2468
<i>NORTH</i>	223	53	48	324
<i>NORTH WEST</i>	544	276	8	828
<i>WEST</i>	731	470	27	1228
<i>SOUTH</i>	399	192	41	632
<i>SOUTH WEST</i>	339	188	1	528

From table 1, it can be ascertained that there is a total of 10 678 nursery schools in the republic of Cameroon. Out of the 10 678 nursery schools, the centre region has the highest number 3 532 of the 10 678 nursery schools in the republic.

Table 2: Distribution of Nursery school Teachers according to school types and regions adopted 2019-2020 MINEDUB statistical year book

REGION	Government			Private			PTA or, Council			TOTAL		
	F	M	T	F	M	T	F	M	T	F	M	T
CAMEROON	10 000	185	10 185	17 454	493	17 947	484	64	548	27 938	742	28 680
ADAMAWA	262	5	267	290	24	314	29	14	43	581	43	624
CENTRE	2 554	40	2 594	7 689	242	7 931	28	2	30	10 271	284	10 555
EAST	693	10	703	465	29	494	133	35	168	1 291	74	1 365
EXTREME-NORTH	556	52	608	189	11	200	48	5	53	793	68	861
LITTORAL	1 218	21	1 239	6 028	98	6 126	59	0	59	7 305	119	7 424
NORTH	538	19	557	172	10	182	75	5	80	785	34	819
NORTH WEST	828	4	832	381	18	399	12	0	12	1 221	22	1 243
WEST	1 916	11	1 927	1 217	29	1 246	43	1	44	3 176	41	3 217
SOUTH	831	13	844	466	21	487	56	2	58	1 353	36	1 389
SOUTH WEST	604	10	614	557	11	568	1	0	1	1 162	21	1 183

From table 2, it can be seen that there is a total of 28680 Nursery school teachers distributed throughout the 10 regions of the country. The centre region has the highest number of nursery school teacher in the entire republic with a total of 10 555 of the 28 680 nursery school teachers in the country.

Table 3: Distribution of primary schools according to school type and Regions adopted from 2019-2020 MINEDUB statistical year book

REGION	Government	Private	Community	Total
CAMEROON	12972	6566	366	19904
ADAMAWA	943	135	22	1100
CENTRE	2001	2461	8	4470
EAST	940	170	8	1118
EXTREME-NORTH	2201	205	191	2597
LITTORAL	800	2148	9	2957
NORTH	1568	116	101	1785
NORTH WEST	1269	270	2	1541
WEST	1501	664	19	2184
SOUTH	872	179	3	1054
SOUTH WEST	877	218	3	1098

From the statistics presented on table 3 it can be seen that there is a total of 19904 primary schools in the Cameroon with the centre region having a highest number of schools as it has a total of 4470 of the 19904 schools in the entire country.

Table 4 : Distribution of primary school teachers according to school type and regions adopted from 2019-2020 MINEDUB statistical year book

REGION	Government			Private			PTA or, council teachers			TOTAL		
	F	M	T	F	M	T	F	M	T	F	M	T
CAMEROON	28	30	59	27	13	40	128	627	755	55	44	100
	227	844	071	304	217	521				659	688	347
ADAMAWA	1	1	3	454	401	855	9	20	29	1	2	4
	469	883	352							932	304	236
CENTRE	6	3	9	10	4	15	8	14	22	16	8	24
	157	610	767	666	408	074				831	032	863
EAST	1	1	3	581	471	1	5	7	12	2	2	4
	883	958	841			052				469	436	905
EXTREME-NORTH	1	8	10	331	1	1	36	415	451	2	10	12
	974	595	569		033	364				341	043	384
LITTORAL	3	1	4	9	4	13	16	10	26	13	5	18
	295	439	734	711	280	991				022	729	751
NORTH	1	5	7	242	547	789	28	137	165	1	6	8
	516	569	085							786	253	039
NORTH WEST	2	1	4	870	421	1	0	0	0	3	2	5
	470	653	123			291				340	074	414
WEST	5	3	8	2	983	3	22	15	37	8	4	12
	476	017	493	583		566				081	015	096
SOUTH	1	1	3	521	364	885	0	4	4	2	2	4
	681	891	572							202	259	461
SOUTH WEST	2	1	3	1	309	1	4	5	9	3	1	5
	306	229	535	345		654				655	543	198

From the statistics presented on table 4, it can be seen that there is a total of 100 347 teachers in the republic of Cameroon. The centre region had a majority of the schools as it had a total of 24 863 of the 10 347 schools nation-wide.

Sample

A sample is a part of a population that represents the characteristics of the parent population (Mohammed, 2018), the researcher further intimates that the sampled population must be a representative of the parent population. Thus, the sampled population must have a similar characteristic to the parent population of the study. A sample is drawn because the researcher does not have enough time to study the entire population, also because it is difficult for the researcher to study the entire population Taherdoost (2016). Given the fact that it was very difficult for the researcher to study all the 129,027 nursery and primary school teachers throughout the nation, the researcher derived a sampled population for the study using Research Advisor (2006) sample size table as shown on table 3.

Table 5: Sample size table (Research Advisor,2006)

Population Size	Confidence = 95.0%					Confidence = 99.0%				
	Degree of Accuracy/Margin of Error					Degree of Accuracy/Margin of Error				
	0.05	0.035	0.025	0.01		0.05	0.035	0.025	0.01	
10	10	10	10	10		10	10	10	10	
20	19	20	20	20		19	20	20	20	
30	26	29	29	30		29	29	30	30	
50	44	47	48	50		47	48	49	50	
75	63	69	72	74		67	71	73	75	
100	80	89	94	99		87	93	96	99	
150	108	126	137	148		122	138	142	149	
200	132	160	177	196		154	174	186	198	
250	152	190	215	244		182	211	229	246	
300	169	217	251	291		207	246	270	295	
400	196	265	310	364		250	309	348	391	
500	217	306	377	475		285	365	421	485	
600	234	340	432	565		315	416	490	579	
700	248	370	481	653		341	462	554	672	
800	260	396	526	739		363	503	615	763	
900	269	419	568	823		382	541	672	854	
1,000	278	440	606	906		399	575	727	943	
1,200	291	474	674	1067		427	636	827	1119	
1,500	306	515	759	1297		460	712	959	1376	
2,000	322	563	869	1655		498	808	1141	1785	
2,500	333	597	952	1984		524	879	1288	2173	
3,000	346	641	1068	2565		558	977	1510	2890	
5,000	387	678	1176	3288		586	1066	1734	3842	
7,500	365	710	1275	4211		610	1147	1960	5165	
10,000	370	727	1332	4899		622	1193	2098	6239	
25,000	378	760	1448	6539		646	1285	2399	9972	
50,000	381	772	1491	8056		655	1318	2520	12455	
75,000	382	776	1506	8514		658	1330	2562	13883	
100,000	383	778	1513	8762		659	1336	2585	14227	
250,000	384	782	1527	9248		662	1347	2626	15555	
500,000	384	783	1532	9423		663	1350	2640	16055	
1,000,000	384	783	1534	9512		663	1352	2647	16317	
2,500,000	384	784	1536	9567		663	1353	2651	16478	
10,000,000	384	784	1536	9594		663	1354	2653	16560	
100,000,000	384	784	1537	9603		663	1354	2654	16584	
264,000,000	384	784	1537	9603		663	1354	2654	16586	

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From table 5, the sample size was determined at 95% confidence level and 5% error margin, thus indicating that the researcher is confident that the sample size is 95% accurate with just 5%

chance of possible mistakes. The sampled population for this study thus, was made up of 384 nursery and primary school teachers drawn from the ten regions of the republic of Cameroon.

Sampling Procedure

Sampling procedure is the process of drawing out a sample from the parent population. Various techniques were used in drawing the sample population for the study. The sampling technique used to draw the sample for this study to answer research questions 1, 2 and 3 was the probabilistic sampling technique in which the stratified sampling techniques was used to get the sampled population for the study. In doing this, each region was divided into urban, semi urban and rural areas and the questionnaire was administered to each segment of the region. This was aimed at getting variety of opinion and ensuring representativity. In each stratum of the region, the Simple Random Sampling Technique was used to draw a total of 384 participants, who were considered to be a subset of the parent population for the study. The 384 participants were administered the online questionnaire which they filled on the spot with the help of research assistants.

In the experimentation phase of the study aimed at answering research question 4, the simple Random Sampling Technique was used to draw out 50 participants. The Simple Random Sampling (SRS) Technique is a sampling technique in which all members of the parent population have an equal chance to be included in the sampled population (Salkind, 2010). In using the SRS technique, the researcher collected the names of all the basic education schools in the centre region from the regional delegation. The names of all the schools were cut and shuffled in a basket. Then a four-year-old boy was called upon to draw out ballots from the basket. The schools that were drawn were automatically included in the sample. The researchers went to the selected schools and randomly selected 50 teachers who took part in IMT model experiment.

Data Collection Instruments

The instruments used in collecting quantitative data for the nation-wide survey was a set of questionnaire with both open and closed ended items. The instrument was divided into three parts, reflecting the variables of the study. In each of the parts, both qualitative and quantitative data were collected. The first part of the instrument collected both qualitative and quantitative data of the weaknesses underpinning the one-shot model to enhance teachers' professional

development. On the other hand, the second part of the questionnaire collected both quantitative and qualitative data related to teachers' preference in the design consideration to enhance Teachers' professional Development and finally, the third part collected both quantitative and qualitative data on policies orientations in teachers' professional development.

All these was aimed at answering research questions one, two and three. To answer research question four of the study, a set of pretest and post-test was administered on the 50 teachers who took part in the experimentation phase of the study through the use of Interactive Mobile Technology (IMT) model for teachers' professional development.

Validity of the Instruments

Validity is the extent to which an instrument measures what it asserts to measure (Blumberg et al 2005). To Robson (2011) validity is the extent to which to which an instrument measures what it is designed to measure. Thus, validity of a research instrument is the extent to which the instrument measures the variables for which it is designed to measure. In research validity has two essential parts: internal (credibility) and external (transferability) validity (Haradham, 2017). Internal validity verifies if the findings of the study are legitimate due to the manner in which the population was sampled, data were collected and analyzed. In a nutshell, it verifies if the study can be replicated (Willis, 2007). On the other hand, external validity verifies if the findings gotten from a study can be transferred to other groups of interest (Last, 2001).

The research instruments used in collecting data for this study were constructed by the researcher and its face and content validities were verified. Face validity is the minimum index of content validity which is determined after a test instrument has been constructed (Haradham, 2017). To ensure the face and content validities of the instruments, the researcher submitted the test instruments to other researching students of the same level and field of study; they went through the instruments and made necessary corrections. The necessary corrections were effected and submitted to the research supervisors who went through the instruments and made further corrections. The corrections were further effected before administration of the instrument.

Reliability of the Instrument

Test reliability refers to a measurement that provides consistent findings with equal values (Blumberg et al 2005). Test reliability measures consistency precision, repeatability and

trustworthiness of a study (Chackrabarty, 2013). Thus reliability of a test instrument is the degree to which a test instrument measures given constructs consistently. Reliability is usually carried out to eject issues related to subjectivity in a research work (Haradham, 2017). Once a researcher adopts a subjective approach in the course of conducting a study, the extent of reliability of the study will be compromised (Wilson, 2010).

To ensure the reliability of the questionnaire instrument, the test-retest reliability method was employed to assess the consistency of responses over time for the questionnaire investigating the mobile model of teacher professional development and its efficacy in enhancing teachers' professional development in nursery and primary schools in Cameroon. The questionnaire was administered twice to the same sample of nursery and primary school teachers in the centre region, with an appropriate interval between administrations. In the first administration, participants were asked to complete the questionnaire independently, ensuring that they understood the instructions and provided honest responses based on their experiences and perceptions. The completed questionnaires were collected, and then, after a suitable interval, the same questionnaire was administered again to the same participants under similar conditions. The responses from both administrations were compared, and the Pearson correlation was used to correlate the responses from the two administrations. A high correlation coefficient .902 between the responses from the two administrations indicated a strong test-retest reliability, suggesting that the questionnaire produces consistent results over time, thus enhancing the reliability and validity of the research findings.

Ethical considerations

Confidentiality of participants' information was rigorously upheld throughout the study. All data collected, including responses to questionnaires, were anonymized and stored securely. Participant identities were protected, and data were used solely for the purposes of research analysis and reporting. Participants' autonomy and right to withdraw from the study at any time without repercussion were respected. They were assured that their decision to participate or withdraw would not impact their professional standing or relationships with the researcher or their institutions.

Data Collection Process

To collect data for the study, the researcher prepared the questionnaire items and inserted them into google forms. The link was then generated and dispatched through research assistants to teachers in the ten regions of Cameroon. The research assistants segmented each region into three strata (urban, semi urban and rural). In each stratum, the participants were randomly selected and administered the online questionnaire, in situations where there were problems of connectivity, the hard copies of the instrument were administered. This was aimed at collecting data to answer research questions one, two and three.

To collect data to answer research question four, a cohort of 50 nursery and primary school teachers in the centre region were randomly selected. The single group pretest posttest quasi-experimental design was used as seen in the table 6.

Table 6: showing Single Group Pretest posttest quasi-experimental research design

Quantitative Method of Data Analyses

Pre-test	Treatment	Post-test
Participants were given a test related to lesson planning	Participants were trained on lesson planning using the IMT model	Participants were administered a posttest on lesson planning

The pretest tested their abilities in lesson planning to ascertain their entry level. After the pre-test, their scores were recorded. Thereafter, they were involved in a six-weeks teacher professional development program based on lesson planning with the use of the IMT model, after which they were administered a post-test to measure the changes in lesson plan preparation practices. At the end of the post-test, their scores were also recorded.

Method of Data Analysis

The quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) version 26.0. The items of part one of the questionnaire, which sought measure the weaknesses of the one-shot model of teacher professional development as well as items of part two of the same instrument which measured issues related to teachers' preferences in the development of a mobile model to enhance teacher professional development and finally part three aimed at

measuring policy issues in the development of a mobile model in enhancing teachers' professional development, were analysed using descriptive and inferential statistics. The descriptive statistics used were percentages, standard deviation, means and frequency counts. The descriptive statistics was aimed at answering research questions 1, 2 and 3.

Data collected to answer research question 4 was analysed using both descriptive and inferential statistics. The descriptive statistics used were percentages, means and frequency counts. On the other hand, the inferential statistics used in analyzing data for this research question was the paired t-test. More vividly during the pre training, teachers' knowledge of lesson preparation was tested and recorded. The same scenario took place after they have been exposed to the IMT model to enhance Teachers' Professional Development. The paired t-test was then used to correlate teachers' scores for both the pre training and post training scores. The paired t-test was used to verify if there was any statistically significant difference between the two set of scores gotten during the pre- training and post training

Qualitative Data Analyses

Canary (2019) opines that there are different methods of analysing qualitative data. Some of the methods of analysing data gathered from qualitative data are thematic content analysis, narrative analysis and deductive analysis.

For this study, the qualitative data was analysed using the thematic content analyses method. The thematic content analysis tries to identify patterns of themes in a transcribed data for proper analysis. The thematic content analysis is advantageous in that it is a flexible method which can be used in both exploratory and deductive studies (Hortensen, Esser & Spillers 2020). To the researchers, the thematic analysis warrants the researcher to constantly move forward and backward between the coded data extract and the analysis being produced. Hortensen, Esser & Spillers (2020) stipulate that the following steps should be followed in order to carry out thematic content analysis:

- Familiarise oneself with the data
- Assign preliminary codes to the data in order to describe the data
- Search for pattern or themes in the data codes across the different interviews
- Review themes

- Define and name themes
- Produce the research report

These steps were followed to analyse the qualitative data gathered from the open ended questions on the questionnaire used in answering research questions one, two and three of this research work as seen on appendix 1.

Summary

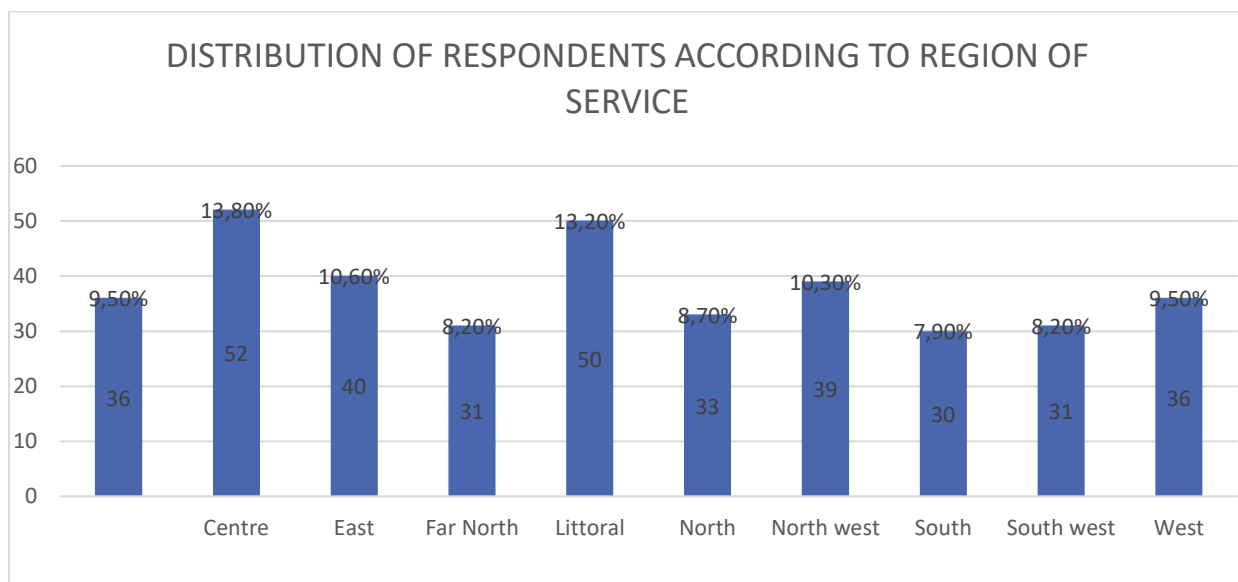
In this chapter of the study, the methodology used in conducting the study was described in detail. The research design, which was the mixed research design was identified and presented. The sample population of the study which was made up of 384 nursery and primary school teachers drawn from the ten regions nationwide in the republic of Cameroon were equally presented alongside the sampling techniques which were used to draw the participants of the study. It was also mentioned that the pretest post-test was used geared towards answering research question 4 of this study. The qualitative and quantitative methods of data collection and analysis were also described in this chapter of the study. The questionnaire and test as instruments for data collection were also described alongside the process of ensuring their validity and reliability. The process of data analyses which was made up of both descriptive, inferential and qualitative methods of data analyses were also presented.

CHAPTER FOUR

FINDINGS

This chapter of this research work presents the analyzed data collected from the field. The chapter begins with the presentation of analyzed data gotten from the nation-wide survey aimed at answering research questions one, two and three. In answering each of the afore mentioned research questions, both qualitative and quantitative analyses have been made, however each begins with the quantitative analysis and ends up with the qualitative analysis. The chapter closes with a presentation of the correlation between the pre-test and the post-test in order to answer research question four. After the analyses have been made, the summary of the findings was made.

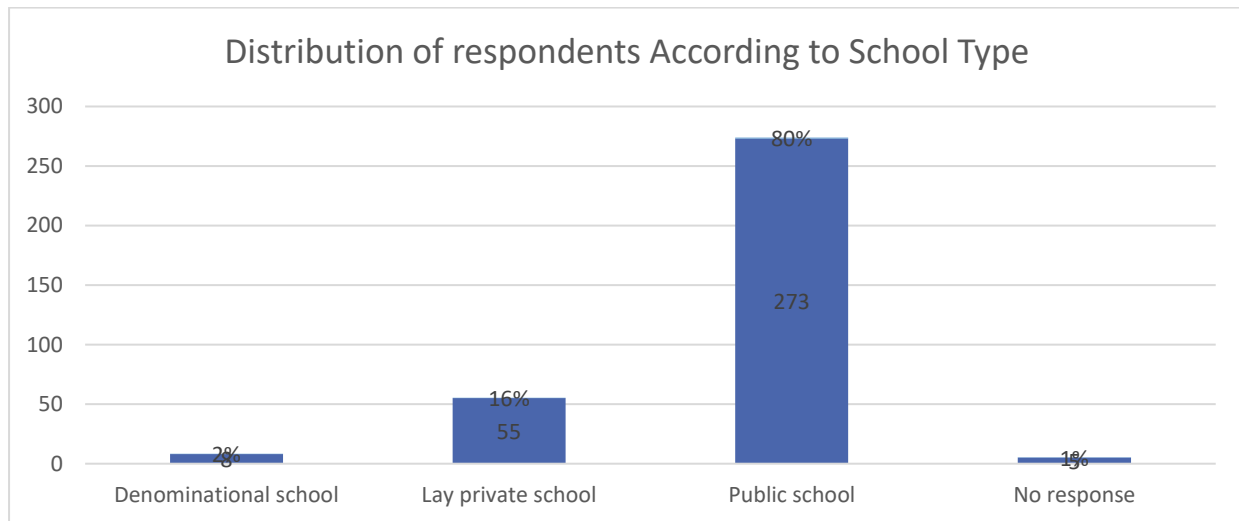
Figure 7: Bar Chart Showing the Distribution of Respondents According to Region of Service



From statistics collected analyzed and presented on figure 7, it can be ascertained that out of the 384 participants of the study, 378 answered this questionnaire item out of which 52 of them are teaching in the centre region of Cameroon, representing 13.8% . similarly, 50 of the participants are working in the littoral region, representing 13.2%. on the other hand, 40 (10.6%) of them are working in the East, 39 (10.3) are in the North West region, 36 (9.5%) are working in the

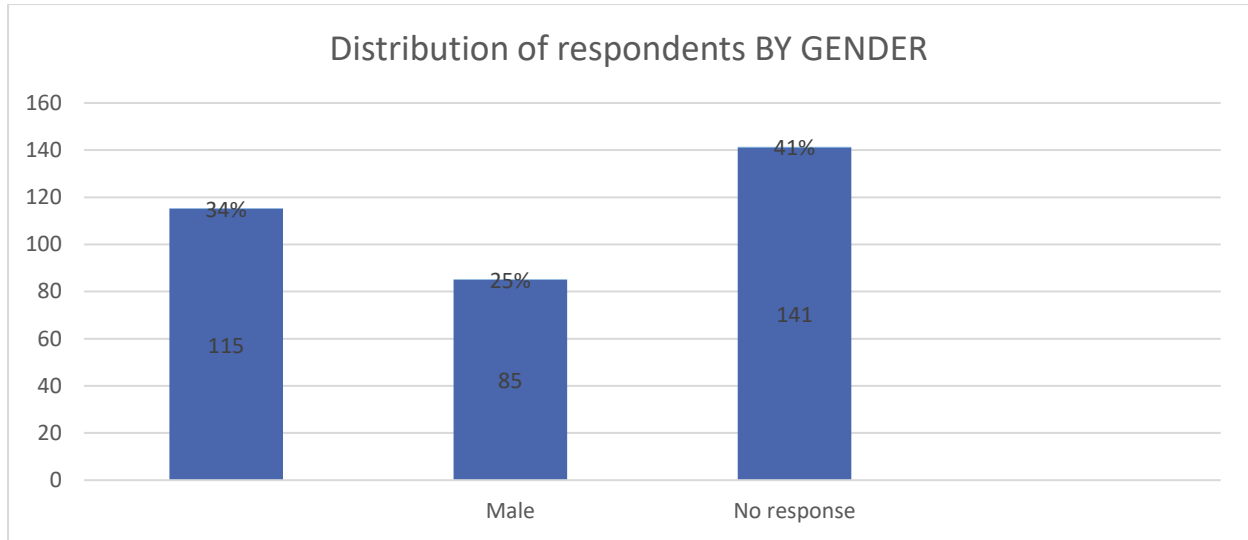
Adamawa region, 36 (9.5%) are teaching in the West region, 33 (8.7%) of the participants are teaching in the Northern Region, 31(8.2%) are teaching in the South West region and 30 (7.9) of all the participants are teaching in the South Region of the Republic of Cameroon.

Figure 8: Bar Chart Showing Distribution of respondents According to School Type



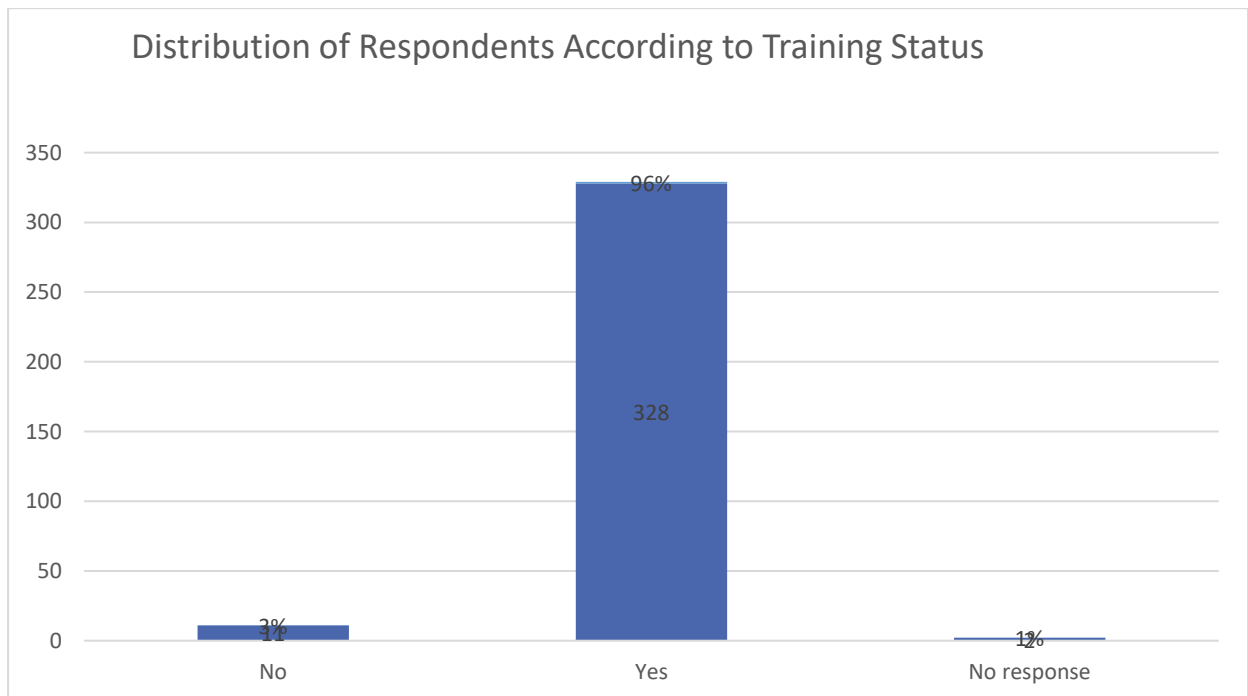
The statistics collected, analyzed and presented on figure 8 reveals that out of the 384 participants of the study, 336 of them responded to this questionnaire item. Out of the 336 of the participants who responded to the item, an overwhelming majority of 273 (80%) of them were teachers in public schools. On the other hand, 55 (16%) of the respondents were teachers in lay private schools and 8 (2%) were teachers in denominational schools.

Figure 9: Bar Chart showing Distribution of Respondents by Gender



From statistics collected, analyzed and presented on figure 9, it can be seen that out of the 384 participants of this study, 378 teachers answered this research question. Out of which 115 (34%) of them were female while 85 (25%) of them were males. Contradictorily, 178 (41%) of the 784 participants of the study did not respond to this questionnaire item.

Figure 10: Bar Chart showing Distribution of Respondents According to Training Status



Statistics gathered, analyzed and presented on figure 10 indicates that out of the 384 respondents for the study, 341 of them responded to this questionnaire item. Out of those who responded to the item, 328 (96%) of them indicated that they were trained teachers while 11 (3%) indicated that they were not trained and 2 (1%) of the teachers did not respond to the questionnaire item.

Figure 11: Bar chart showing distribution of Respondents According to years of experience

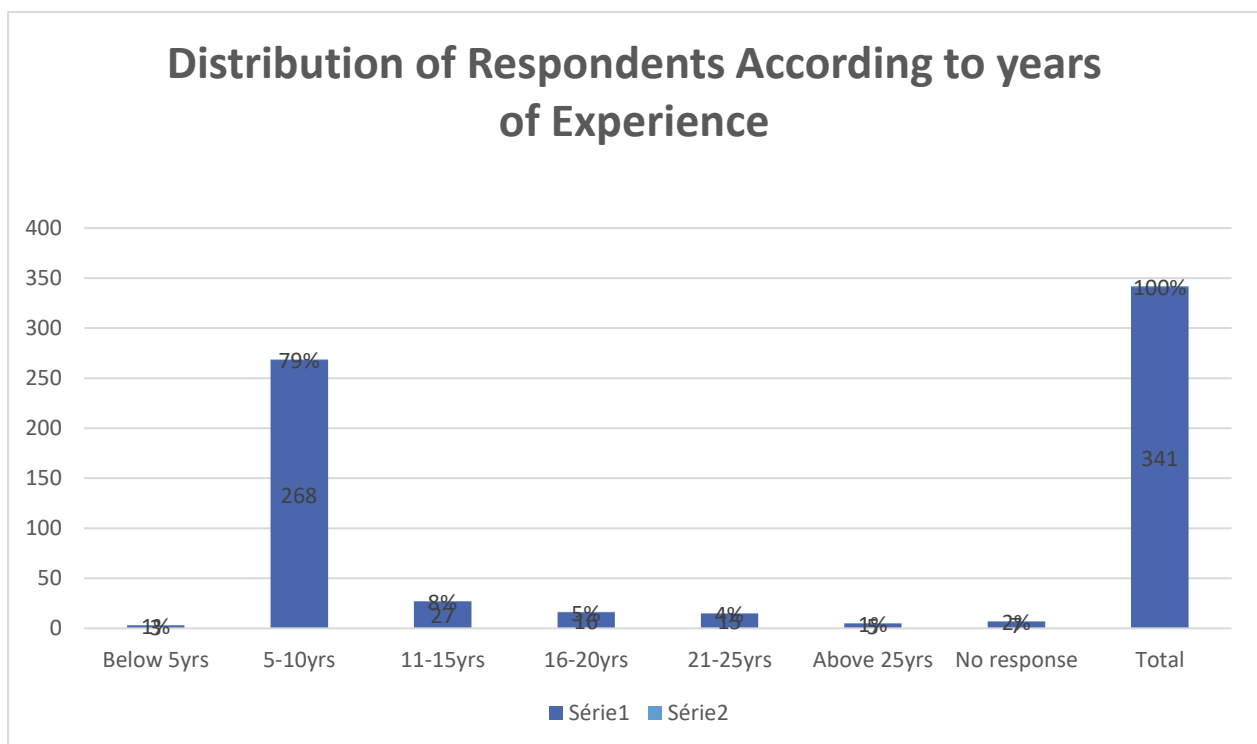
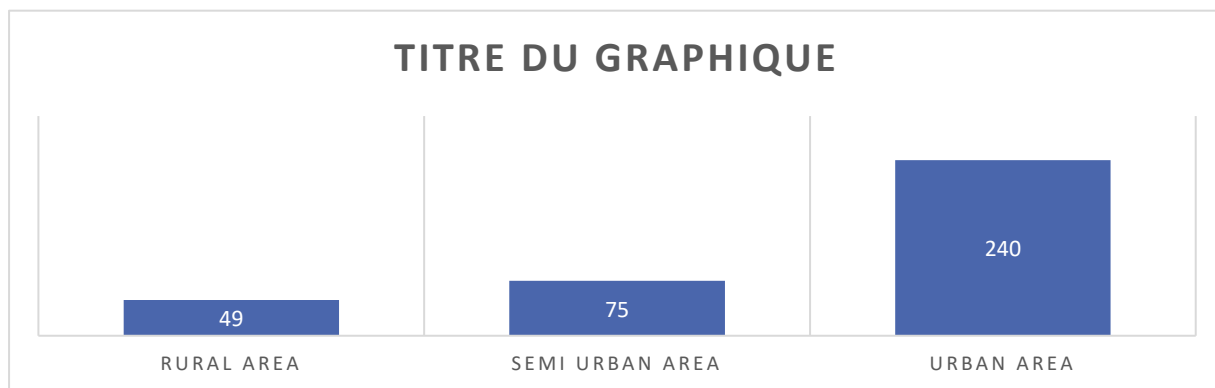


Figure 11 depicts the data relating to years of experience in the field of teaching of the data pointed to the fact that out of the 384 respondents for this research work, 341 of them responded to this questionnaire item. Out of the 341 who responded, 268 (79%) of them have been teaching

for between 5-10 years, 27 (8%) have been teaching for between 11-15 years while 26 (4%) of those who responded to the item have been teaching for between 21-25 years, 5(1%) of the respondents have been teaching for above 25 years.

Figure 12: Bar Chart Showing Distribution of Respondents According to School Location



Data relating to the area of work of the respondents was gathered analyzed and presented on figure 12 the analysis reveals that out of the 384 respondents sampled for this study, 364 of them responded to this questionnaire item. Out of the 364 respondents, 240 of them are working in urban areas while 75% of them are working in semi-urban areas and 49 of the 364 effective respondents for this study are teaching in rural areas.

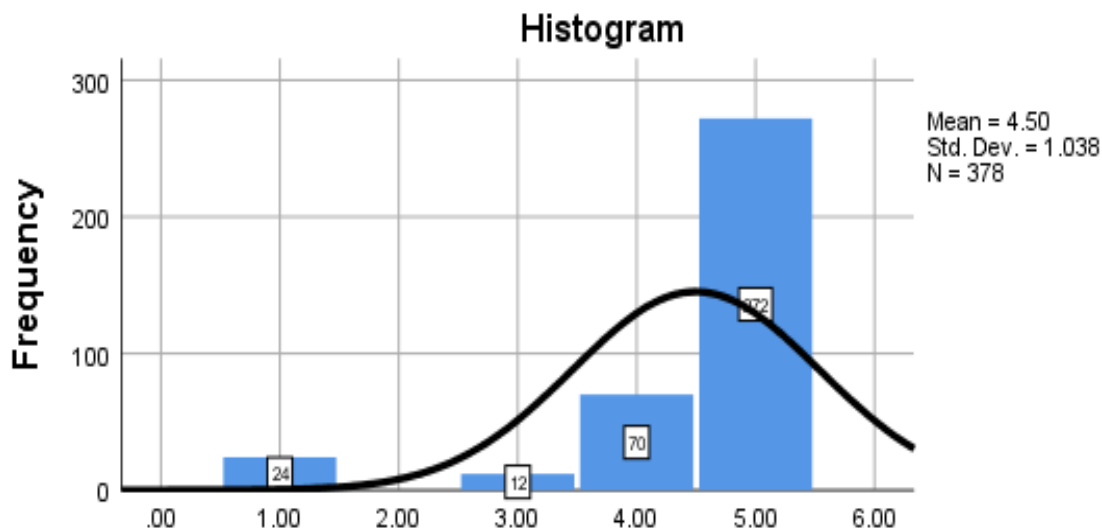
Research Question One: What Are the Weaknesses Underpinning the One-Shot Model to Enhance Teacher Professional Development

This objective was aimed at finding out the weaknesses of the current model used by Cameroon to enhance Teacher Professional Development in nursery and primary schools. To get clear information on this, both quantitative and qualitative data were collected, analyzed and the following findings were gotten.

Quantitative Analysis to Answer research Question One

Here, numerical data were collected with the use of a closed ended questionnaire. The findings have been presented based on the various items on the questionnaire as follows;

Figure 13: Histogram showing participants' views that the use of seminars and workshops to enhance teacher professional development is usually not connected to previous sessions



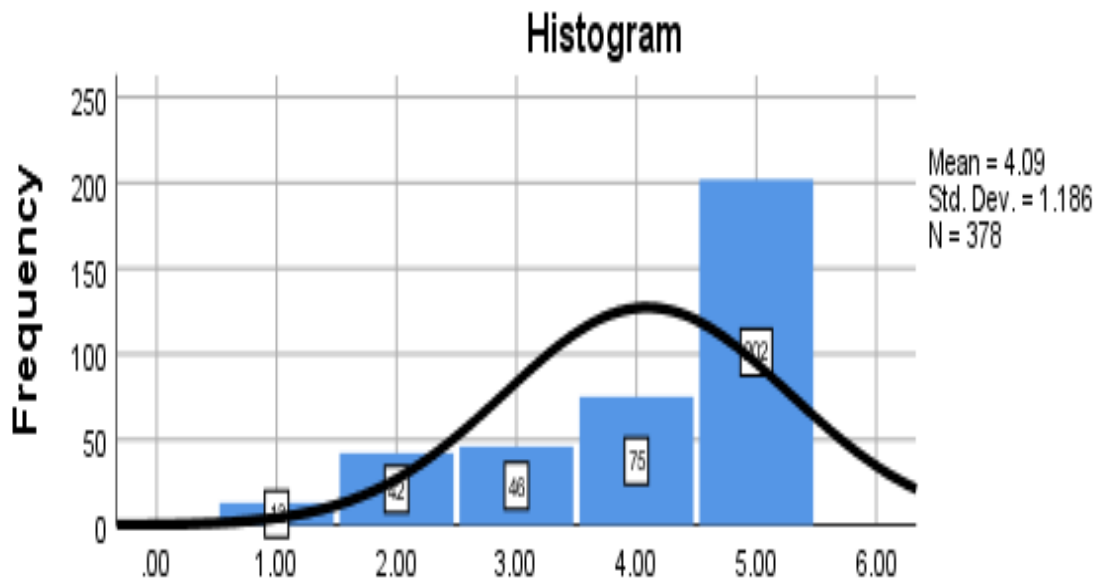
From figure 13 it can be seen that out of the 384 participants sampled for this study, 378 of them responded to this questionnaire item and out of the 378 respondents who responded to the questionnaire item which sought to find out if the use of seminars and workshops to enhance Teachers' Professional Development are usually not connected to previous sessions, 342 agree that the use of seminars and workshops are usually not connected to previous session. This is so

as 172 of the 378 respondents strongly agree to the fact that the use of seminars and workshops to enhance Teachers' Professional Development is usually not connected to previous sessions, while 70 of the total respondents agree to the fact.

Contradictorily, 24 out of the 378 respondents held the view point that the use of seminars and workshops to enhance Teachers' Professional Development are usually connected to previous sessions. In detail, 24 out of the total respondent strongly disagreed to the fact while 0 of the total respondents disagreed to the fact, while 12 of the total respondents held a neutral view point on the fact that the use of seminars and workshops to enhance Teachers' Professional Development are usually not connected to the previous sessions.

From the foregoing, it can be ascertained from the data gathered and analyzed from the 378 respondents in the 10 regions of the Republic of Cameroon that the use of seminars and workshops to enhance Teachers' Professional Development is usually not connected to previous sessions

Figure 14: Histogram showing respondents' views that Teachers' difficulties are usually not taken into consideration when choosing the topics for seminars and workshops



Teachers' difficulties are usually not taken into consideration when choosing the topics for seminars and workshops

Based on data gathered and analyzed and presented on figure 14, it was found out that out of the 384 participants sampled for this study, 378 of them responded to this questionnaire item and out of the 378 respondents who responded to this questionnaire item, 277 of them agreed that in using seminars and workshops to enhance Teachers' Professional Development, the difficulties of teachers are usually not taken into consideration when selecting topics of discussions.

On the other hand, 55 of the respondents held a contrary view, thereby attesting that the difficulties of teachers are usually taken into consideration when selecting topics of discussion during seminars and workshops. While this is the case 48 of the total respondents held a neutral view.

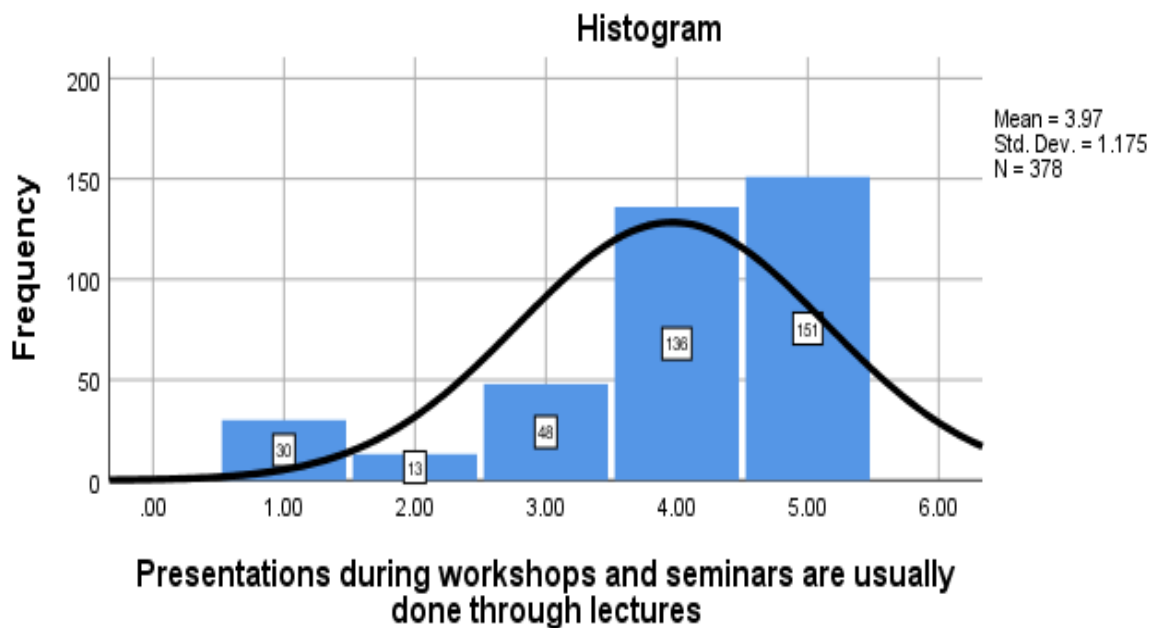
In detail, out of the 277 respondents who agreed that when selecting topics of discussions for seminars and workshops, teachers' difficulties are usually not taken into consideration, 202 of them strongly agreed that teachers' difficulties are usually not taken into consideration when selecting topics of discussions for seminars and workshops, while 75 of the total respondents agreed to the fact.

Similarly, out of the 55 respondents who held the view point that teachers' difficulties are usually taken into consideration when selecting topics of discussions for seminars and workshops to

enhance teachers' professional development, 13 strongly disagreed to the item while 42 disagreed to the questionnaire item.

Therefore, based on data collected and analyzed from 378 basic education teachers, it was found out that when selecting topics of discussions for seminars and workshops to enhance Teachers' Professional Development, teachers' difficulties are usually not taken into consideration. This is based on the fact that 277 out of 378 respondents agreed that when selecting topics of discussions for seminars and workshops to enhance teachers' professional development, the difficulties of the teachers are usually not taken into consideration.

Figure 15: Histogram showing participants' views that Presentations during workshops and seminars are usually done through lectures

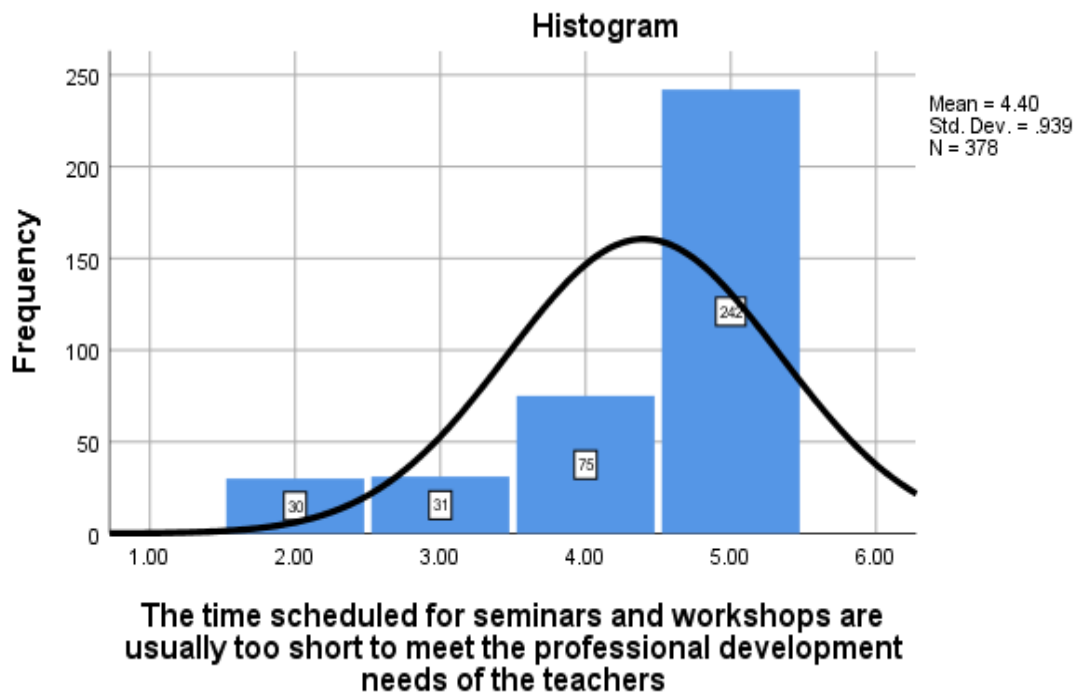


From the statistics gathered, analyzed and presented on figure 15, it can be seen that out of the 384 respondents sampled for this study, 378 of them responded to this questionnaire item. Out of the 378 respondents who answered this questionnaire item 287 of them agreed that presentations during workshops and seminars aimed at enhancing teachers' professional development are usually done through lectures. In detail, out of the 287 respondents who agreed to the fact that presentations during workshops and seminars are usually done through lectures, 151 of the strongly agreed to the fact while 138 of them agreed that presentations during seminars and workshops are usually done through lectures.

Contradictorily, out of the 378 respondents who responded to this questionnaire item, 43 of them disagreed to the idea that during workshops and seminars, presentations are usually done through the use of lectures. For the sake of detail presentation of facts, out of the 43 respondents who disagreed that lectures are used as a means of presentations during seminars and workshops aimed at enhancing teachers' professional development, 30 of them strongly disagreed to the fact, while 13 of the total respondents disagreed to the idea that lectures are usually used as a means of presentation during seminars and workshops. Out of all these, 48 of the 378 respondents held a neutral view point.

From the statistics gathered, analyzed and presented it can be ascertained that during seminars and workshops aimed at enhancing teachers' professional development, lectures are used as a means of presentation. This is so because out of the 378 respondents who answered the questionnaire 287 of them agreed that lectures are used as a means of presentation during seminars and workshops to enhance teachers' professional development.

Figure 16: Histogram showing participants' views that the time scheduled for seminars and workshops are usually too short to meet their professional needs

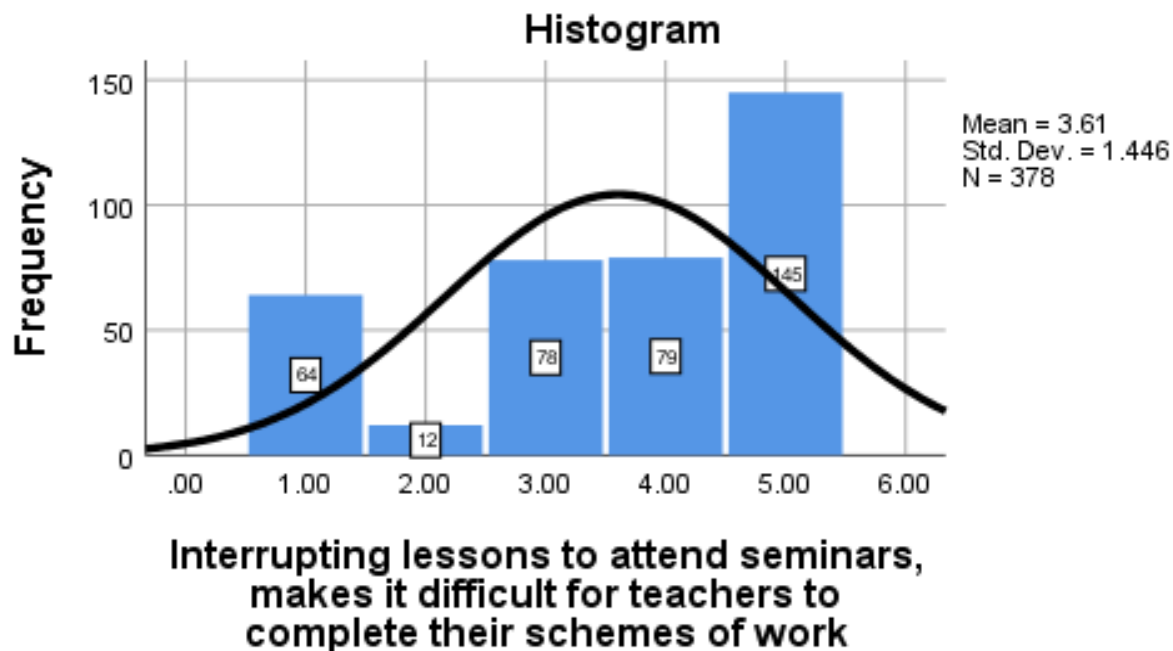


From figure 16 it can be seen that out of the 384 participants earlier chosen for this study, 378 of them answered this questionnaire item and out of the 378 respondents who answered the questionnaire item which sought to find out the sufficiency of the time allocated for teachers' professional development, the findings revealed that 317 of them agreed to the idea the time allocated for seminars and workshops to enhance teachers' professional development is usually too short to meet the needs of the teachers. For detail analysis, it was uncovered that 242 of the respondents strongly agreed to the idea that the time allocated to seminars and workshops to foster teachers' professional development is usually too short. Similarly, 75 of the total respondents agreed that the time scheduled for seminars and workshops to enhance teachers' professional development is usually too short to meet the needs of the teachers.

On the other hand, out of the total 378 respondents, 61 of them disagreed to the idea that the time allocated to seminars and workshops to enhance teachers' professional development is too short to meet the professional needs of the teachers. This is so because 31 of the total respondents disagreed to the idea while 30 of the respondents strongly disagreed to the fact that the time allocated to seminars and workshops to enhance teachers' professional development is usually grossly insufficient to meet the professional development needs of the teachers.

From the foregoing, it was found out that the time allocated for seminars and workshops to foster teachers' professional development is grossly insufficient to meet the professional development needs of the teachers. This is so because out of the 378 basic education teachers who took part in this research question, 317 of them agreed to the notion that the time attributed to seminars and workshops to enhance teachers' professional development is usually grossly insufficient to meet the professional development needs of the teachers.

Figure 17: Histogram showing participants' views on how interrupting lessons to attend TPD impacts their syllabus coverage



Statistics gathered analyzed and presented on table 17 was aimed at finding out if interrupting lessons to attend seminars and workshops makes it difficult for teachers to complete their schemes of work. The findings revealed that out of the 384 research participants, 378 of them responded to this questionnaire item out of which, 224 of them affirmed that interrupting lessons in order to attend seminars and workshops to enhance their professional development actually makes it difficult for the teachers to complete their respective expected work coverage. To be more detailed, out of the 224 participants who agreed to the fact, 145 strongly agreed and 79 agreed that interrupting lessons to attend seminars and workshops actually hampers the effective

coverage of the schemes of work. Giving a total of 224 out of 361 participants who responded to the item.

On the contrary, out of the 378 participants, 76 of them held the view point that interrupting lessons in order to attend seminars and workshops does not hinder the effective coverage of schemes of work. In details, 64 of the 76 participants who held a contrary view strongly disagreed to the statement, while 12 of them simply disagreed, while 78 of the 378 respondents held a neutral view point over the statement.

Qualitative Analysis to Answer Research Question One

The qualitative data for this research question was collected using an opened ended questionnaire item which requested participants to express their view points on other weaknesses underpinning the one-shot model to enhance Teachers' Professional Development not mentioned in the closed ended items of the Questionnaire in Appendix 1 of this study. The data collected was analyzed using the thematic analyses and the finding gotten were presented in five major emerging themes as follows:

The participants of the study were unanimous that the one-shot model to enhance teachers' professional development was weak as they expressed the view point that the time allocated for the one-shot model to enhance teachers' professional development is problematic in two dimensions. Firstly, the participants think that the time allocated for Teachers' Professional Development in Cameroon is grossly inadequate as most often it is held three times a year. Such is the case as a participant expressed decries that *The time is too short to master what is taught...while the work load is quit much, thereby making most seminars very tiring*. This is a clear indicator that the time allocated to carry out seminars and workshop with the aim of enhancing Teachers' Professional Development is usually not sufficient for the participants to assimilate the bulk of work assigned to a given session. It also follows that there is usually mismatch between the content planned to be covered within a session and the actual time allocated to the given session. Yet others expressed the view that even when seminars and workshops are organized, the organizers usually come late and at times if certain high personalities do not arrive the training ground, the training will not start, thus, indicating that in some circumstances, the time allocated for the exercise is usually poorly managed. This is proven as one of the participants hold the view point that *There is usually poor time management*

because the work the inspectors plan to teach teachers during seminars is never covered. As a consequence, when it is 3pm, the inspectors just rush through the remaining work and the teachers who are equally very tired just listen to them present the material the way they like.

The second problem with timing as indicated by the participants is that the period chosen to carry out TPD in Cameroon Basic Education Sub-Sector is usually not appropriate. This is indicative as some of the participants expressed the view point that in their localities, they begin the school year without a single form of Teacher Professional Development and often the trainings are organized in the middle of the school year to train them on pedagogic issues which they would have been taught at the beginning of the school year. The participants thus think that the time and periods allocated to seminars and workshops should be clear at the beginning of the year as most often the organization of the activities are usually sudden and as a consequence, the teachers tend to poorly prepare for the exercise or do not attend due to its abrupt nature. Such idea is clearly expressed by one of the participants who holds that *Seminars are supposed to be held in August to enhance a smooth start of the school year. So, I suggest that seminars should be done at the beginning of the year and not at the middle of the year as almost always the case.* These participants therefore hold the when seminars and workshops are held during inappropriate periods, the actual benefits of the sessions are not fully utilized.

Beside the shortcomings that come with timing of the one-shot model to enhance Teachers' Professional Development, the second theme identified in the responses of the participants was the absence of motivation. Majority of the respondents held the opinion that they are usually not well motivated to pursue TPD programs. Precisely, the participants think that financial allowances are not given to participants during seminars and workshops. To them this constitutes a serious weakness of the one-shot model to enhance teachers' professional development, where instead of motivating the teachers financially, the teachers are expected to chip in money to motivate organizers of the trainings. The participants find this as a weakness because they think that if at all the organizers are to be motivated to carry out the exercise, it is the duty of the state to pay the organizers of the TPD trainings as a participant believes that *Teachers aren't supposed to pay for seminars. So many teachers don't attend because they believed government is supposed to pay for seminars.* Contradictorily, where teachers are expected to pay for the exercise, a

participant regards it as *financial extortion of teachers* yet another think that it is not just financial extortion from teachers but *too much extortion of finances from teachers*.

They further expressed the view point that during the one-shot model to enhance TPD in Cameroon, teachers are expected to buy working materials like presentations and manuals. The respondents made it clear that teachers at times do not have the required finances to purchase such documents which makes the training ineffective. In addition, the teachers think that finances are supposed to be set aside for their transportation and feeding. However, most often the teachers are expected to pay their transportation fare to the training venue and feed themselves. To them, this account for the reason for some absences during TPD trainings as teachers who cannot afford the transportation cost stay away from the exercise. Besides, financial benefits, the respondents also think that if participants of seminars or workshops are given other forms of motivation like certificates of participation, teachers will be greatly motivated to go through professional development programs. Thus, according to the participants, motivation should span beyond financial incentives to certification and other forms of motivation. Thus, the respondents are of the view point that the absence of financial incentives and other forms of motivation given to teachers to encourage their attendance and pay for other costs of the one-shot model of Teacher Professional Development constitutes a serious weakness of the model.

Furthermore, the third emerging theme from the responses of the participants is that of the content of TPD programs. Firstly, the participants expressed the view point that the content of seminars and workshops constitute another weakness of the one-shot model to enhance teachers' professional development. This is because the content of the one-shot model to enhance Teachers' Professional Development is usually irrelevant to some of the teachers the content does not meet their professional needs, a situation which according to them is due to inadequate needs analysis done by the organizers of the training as a participant believes that ... *and need analysis not always done to actually see what the main challenges of teachers are before deciding on seminar themes*. This, thus points to the fact that the one-shot model of TPD in Cameroon lacks appropriate needs analysis prior to its implementation.

In addition, the fourth emerging theme of the responses of basic education teachers nationwide is that of the inadequate quality of seminar and workshop facilitators. The teachers indicated that some of the presenters during the one-shot model of TPD do not master the content which is being delivered and as such, teachers leave the training session, most often than not more

confused with inadequate clear explanation of the topics discussed during the training session. Some of the respondents purported that the organizers during the training sessions usually have conflicting views over the topic of discussion during seminars and workshops, a situation which leaves the participants more confused than they came in for the training as a participants hold that *Sometimes the resource persons are not knowledgeable in the theme of the seminar*. Such knowledge inadequacy makes it difficult for the resource persons to effectively deliver the needed knowledge to enable teachers be more productive in the discharge of their functions.

Moreover, the fifth major emerging theme is that of the theoretical nature of the presentations during TPD using the one-shot model. The respondents think that the one-shot model to enhance TPD is usually too theoretical with inadequate materials to render discussions and the training more palpable. These respondents think that due to the large crowd of teachers who attend seminars and workshops, there should be adequate use of speakers, microphones and projector to illustrate concepts being discussed. But most often than not, these materials are absent making the training sessions highly theoretical and rendering teachers' assimilation of concepts difficult. This is seen as a participant thinks that the one-shot model to enhance TPD is weak because of *the absence of modern technology facilities like the power point etc*. Thus, for TPD exercise to be effective, one of the participant thinks that *materials are needed to properly train teachers to the understanding of everyone*. These situations constitute weaknesses of the one-shot model to enhance Teachers' Professional Development.

Research Question 2: What are teachers' Preferences in the Design of a Mobile Model to Enhance Teachers' Professional Development?

This research question was aimed at finding out teachers' preferences in the design of a mobile model to enhance teachers' professional development. To ensure adequate clarity, both qualitative and quantitative data were collected and analyzed. The findings gotten were as follows:

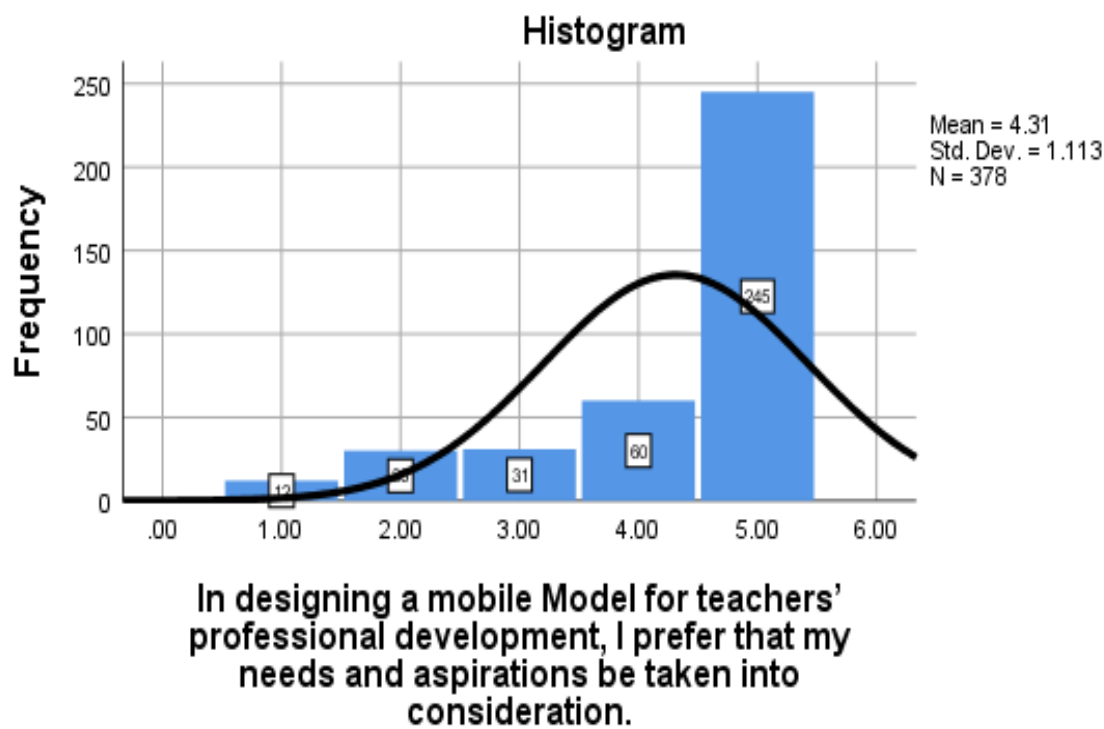
Quantitative Analysis to Answer Research Question Two

The quantitative data for this research question was found on section II of the closed ended questionnaire used in collecting data for this study. The section is further sub divided into sub sections a, b and c to test the different components on the IMT model presented on figure 2. 4 of

this research work. The findings have been presented as follows according to the various items found on the afore mentioned section of the instrument;

a. Teachers' Community

Figure 18: Histogram showing respondents' preference in taking their needs and aspirations being taken into consideration when planning for teachers' professional development

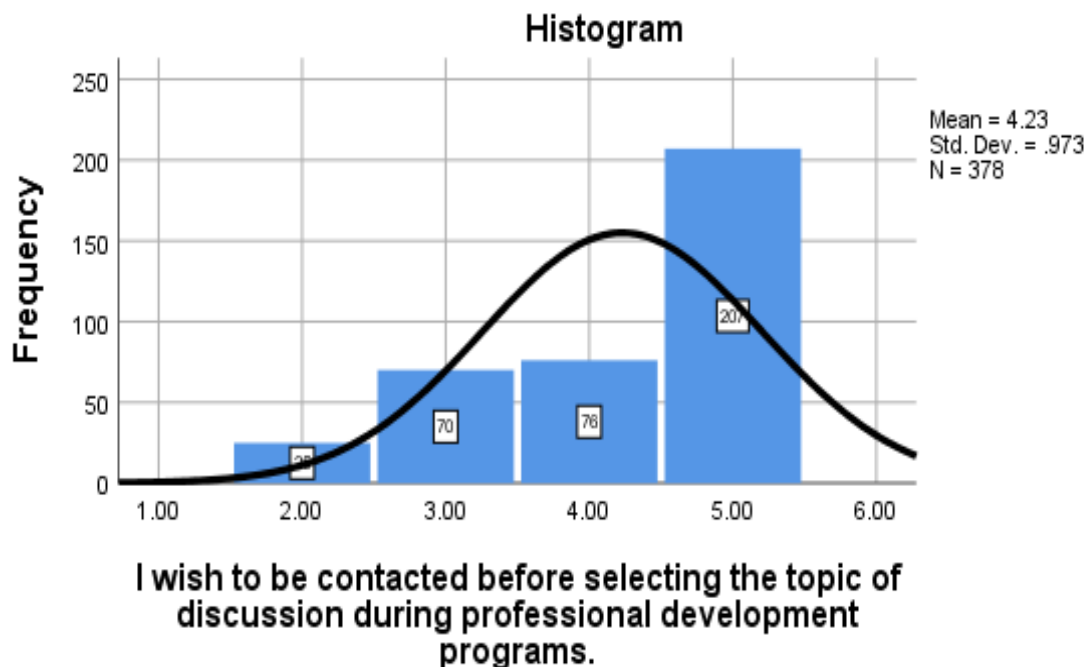


The statistics gathered, analyzed and presented on figure 18 was aimed at finding out if the needs and aspirations of teachers should be taken into consideration in designing a mobile model to enhance teachers' professional development. The findings revealed that out of the 384 research participants sampled for this study, 378 of them responded to this questionnaire item and out of the 378 participants who responded to this questionnaire item, 306 of the agreed that when designing a mobile model to enhance teachers' professional development, the needs and aspirations of the teachers should be taken into consideration. To be more detailed, out of the 306 respondents who adhered to this questionnaire item, 245 of them strongly agreed while 60 agreed

that in designing a mobile model to enhance teachers' professional development, the needs and aspirations of the teachers should be taken into consideration. The teachers prefer that their needs and aspirations be taken into consideration so that the activities of the teachers' community can be more meaningful in enhancing their professional development.

On the contrary, out of the 378 participants who responded to the item, 41 of them held a contrary view by disagreeing that their needs and aspirations should not be taken into consideration when designing a mobile model to enhance their professional development. Concretely, out of the 41 participants who held a contrary view, 12 strongly disagreed and 29 disagreed to the facts that their needs and aspirations should not be sought when designing a mobile model to enhance teachers' professional development. While this was the case, 39 of the 378 respondents maintained a neutral position as to whether teachers' needs and aspirations should be taken into consideration when designing a mobile model to enhance teachers' professional development.

Figure 19: Histogram showing respondents' preference to be contacted before selecting the topic of discussion during professional development programs.

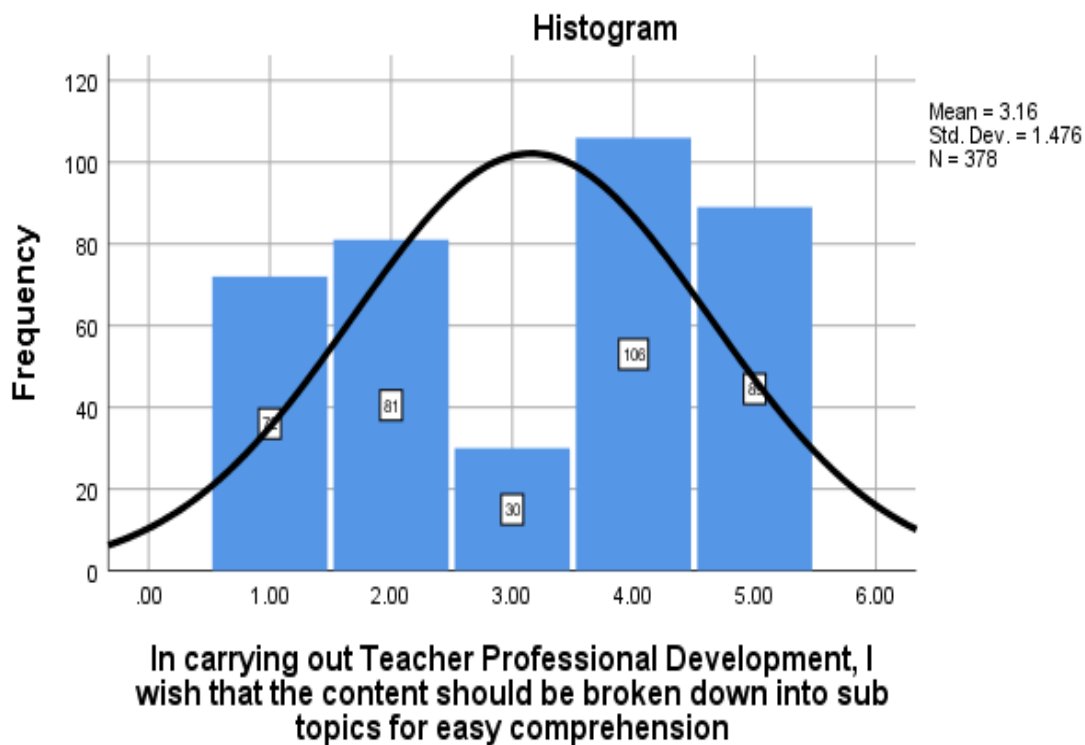


Statistics collected, analyzed and presented on figure 19 was aimed at finding out if participants will wish to be contacted before selecting topics of discussions for teachers' professional

development programs. The findings revealed that out of the 384 respondents who were sampled for this study, 378 of them effectively responded to this research item and out of the 378 respondents who answered the questionnaire item, 283 of them agreed that they will wish to be contacted before choosing a topic of discussion during professional development programs. Specifically, 207 strongly agreed while 76 agreed that they will love to be contacted before selecting topic of discussions aiming at enhancing their professional development. This is in a bid to maximise the gains of the activities taking place in the teachers' community.

Contrarily, 35 of the 378 respondents where not for the fact that they should be contacted when selecting topics for discussions during professional development programs. Specifically, 70 of the respondents disagreed while 28 strongly disagreed to the fact that they should be contacted when choosing topics to enhance teachers' professional development.

Figure 20: Histogram showing respondents' preferences for Teacher Professional Development content to be broken down into sub topics for easy comprehension



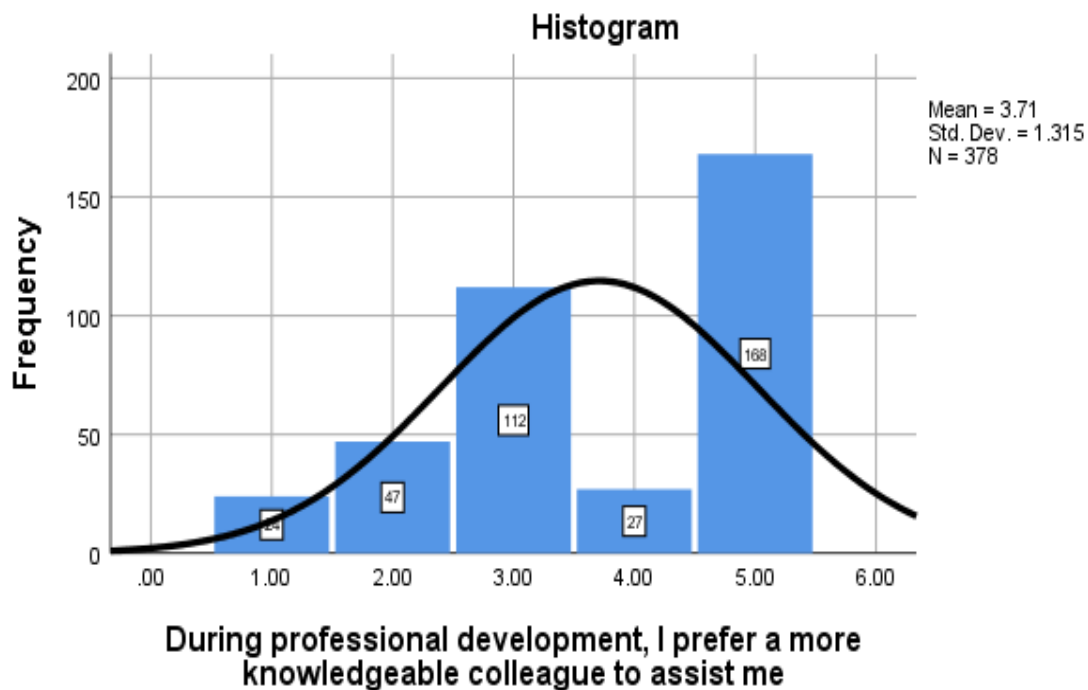
This questionnaire item whose statistics was gathered, analyzed and presented on figure 20, sought to find out if participants will prefer that content used in enhancing teachers' professional development should be broken down into sub topics in order to enhance understanding. The data

collected and analyzed revealed that out of the 384 participants who were sampled to take part in this study, 378 of them effectively answered this research question and out of the 378 participants who responded to the questionnaire items, 89 strongly agreed while 106 agreed that in carrying out teacher professional development, they wish that the content should be broken down into sub topics in order to foster comprehension. Therefore, a total of 195 out of the 378 respondents held a positive view point that the content of teacher professional development programs should be broken down into sub topics to facilitate understanding.

Contradictorily, 72 strongly disagreed and 81 of the participants disagreed that the content of teacher professional development programs should be broken down into sub topics in order to facilitate comprehension. While 30 of the participants were neutral over the idea. Therefore, a total of 153 of the 378 participants who actually responded to this research question did not agree that in carrying out teacher professional development, the content should be broken down into sub topics in order to facilitate comprehension.

b. More Knowledgeable Others (MKO)

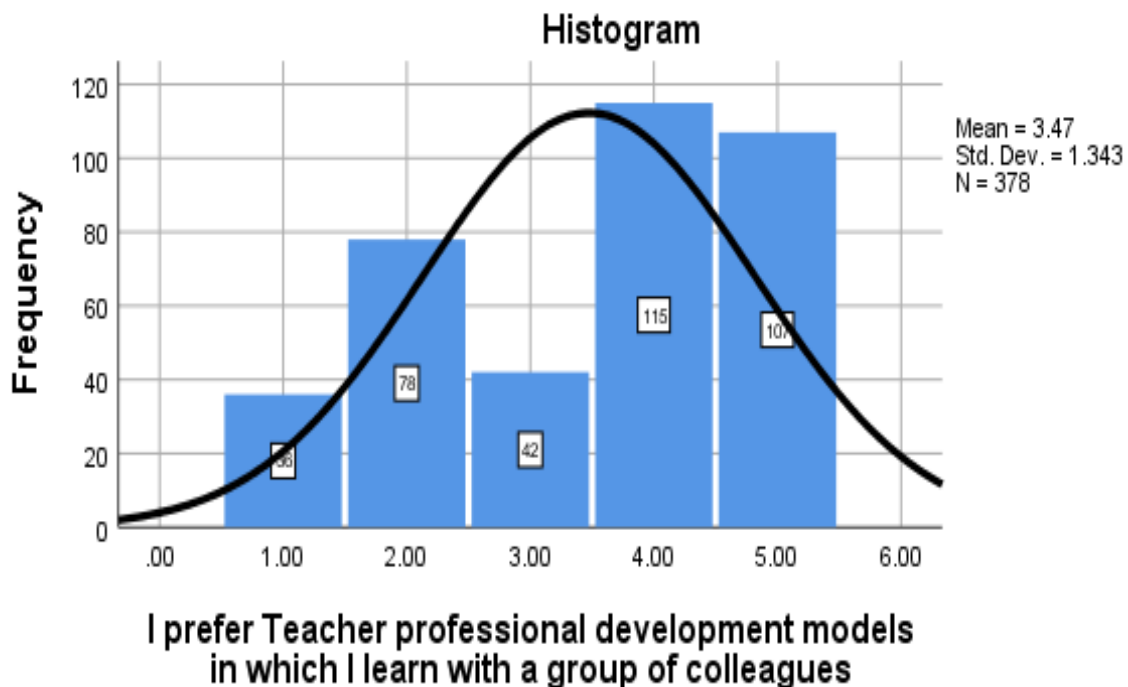
Figure 21: Histogram showing respondents' preference in more knowledgeable colleagues assisting them during professional development



The statistics presented on figure 21 was aimed at finding out if participants will prefer a more knowledgeable colleague to assist them in the course of their professional development. Out of the 384 respondents who were sampled for this study, 378 of them effectively responded this questionnaire item. Out of the 378 respondents, 198 of them agreed to the fact that they will love to be placed under the assistance of a more knowledgeable colleague for guidance in the course of their professional development. Specifically, 168 of the 378 respondents strongly agreed that they wish that a more knowledgeable colleague should assist them in the course of their professional development while 27 of the 378 respondents agreed to the idea. This preference is in a bid of maintaining a sustained connection with other teachers and a MKO.

On the other hand, 71 of the 378 respondents were against the fact that they will like a more knowledgeable colleague to assist them in the course of their professional development. Out of the 71 respondents who had a contrary view to this research question, 24 of them strongly disagreed that a more knowledgeable colleague should assist them in the course of their professional development, while 47 of them disagreed that they will love to be assisted by a more knowledgeable colleague in the course of their professional development.

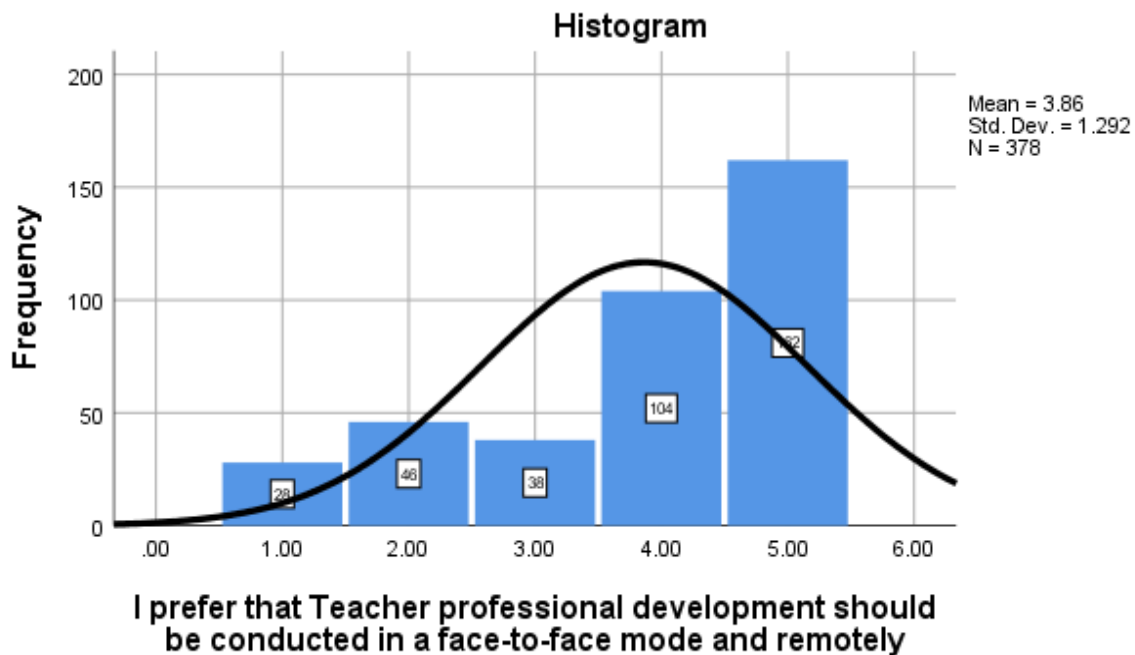
Figure 22: Histogram depicting Teachers' preference to Carry out TPD with group of colleagues



This questionnaire item sought to find out if participants prefer a teacher development model in which they learn with a group of colleagues. Statistics gathered, analyzed and presented on figure 22 revealed that out of the 378 respondents who answered the questionnaire item, 107 of them strongly agreed while 115 agreed to the idea that they prefer teacher professional development model in which they learn with group of colleagues. Therefore, a total of 222 of the 378 respondents adhered to the idea that they prefer a teacher professional development model in which they learn in a group with colleagues. This is in a bid to ensure have sustained connections with the MKO and other colleagues.

By contrast, out of the 378 respondents, 78 of them strongly disagreed and 36 disagreed while 42 of them were neutral over the fact that they prefer teacher professional models in which they learn in a group with colleagues. Therefore out of the 378 participants who responded this questionnaire item, a total of 141 of them held a contrary view over the fact that they prefer a teacher professional development model in which they work in a group with colleagues.

Figure 23: Histogram depicting respondents' preferences for Teacher Professional Development Should be Conducted in a face-to-face Mode and remotely

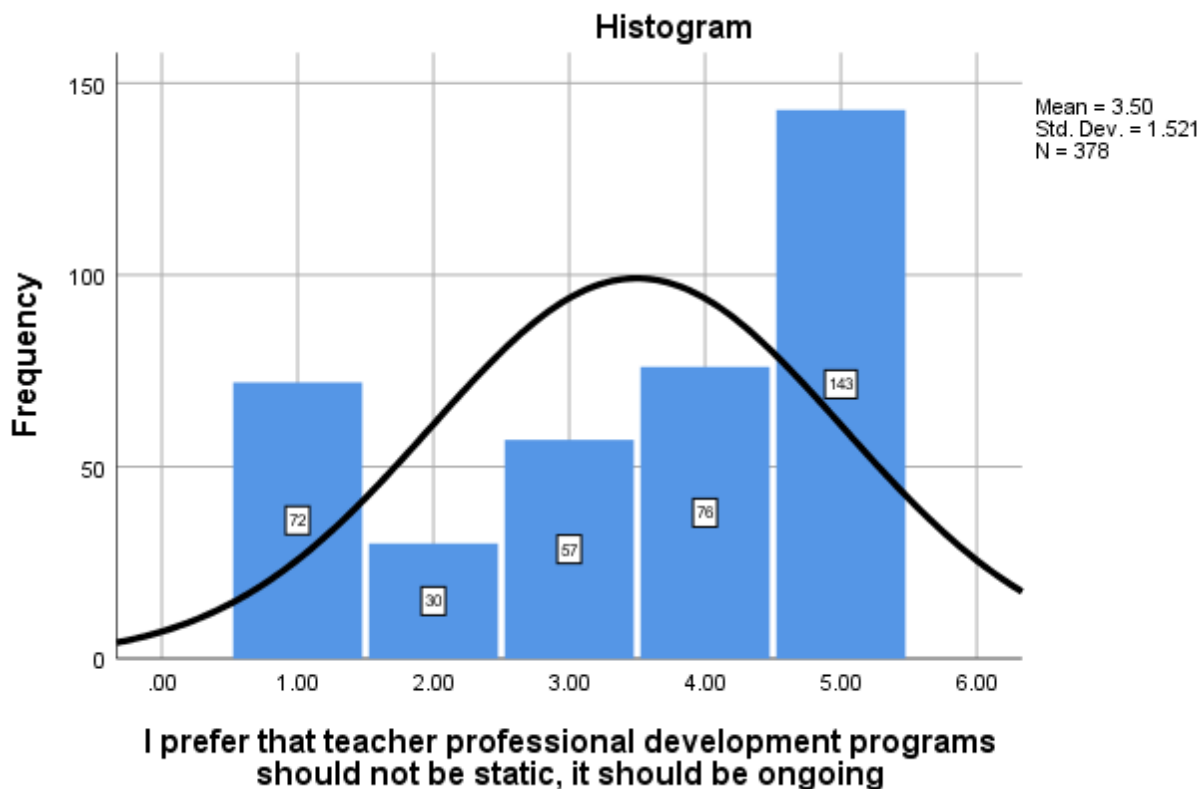


This questionnaire item whose statistics were gathered, analyzed and presented on figure 23 sought to find out if participants prefer that teacher professional development programs should be conducted on a face-to-face mode and remotely. The data collected and analyzed revealed that

out of the 384 participants who were earlier sampled to take part in this study, 378 of them actually responded to this questionnaire item. Out of the 378 participants who responded actually responded to this questionnaire item, 162 of them strongly agreed while 104 agreed that they will prefer that teacher professional programs be conducted in a face-to-face mode as well as remotely. Therefore, a total of 266 out of the 378 participants affirmed that they will prefer that teacher professional development programs be done both in a face-to-face mode as well as remotely. This is as a means to ensure sustained connections through the experience of human touch with other teachers and the MKO.

Contradictorily, 46 of the participants strongly disagreed, while 28 of them disagreed and 38 of the participants were neutral to the idea that teacher professional development programs should be done both on a face-to-face mode as well as remotely. Thus, a total of 74 out of the 378 participants held a negative view that teacher professional development programs should be done both on a face-to-face mode and remotely.

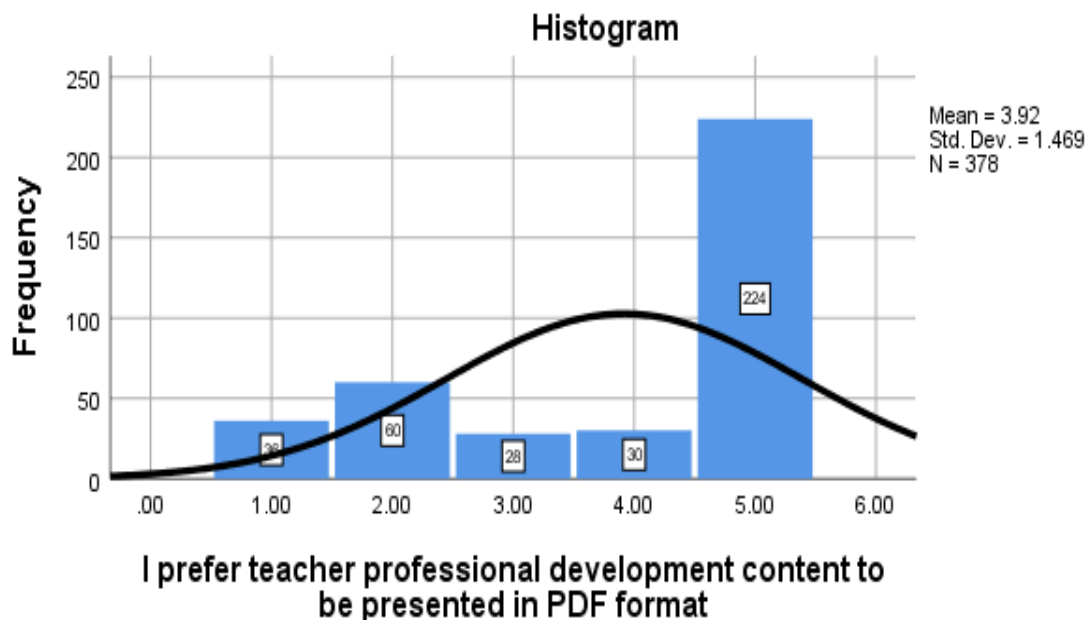
Figure 24: Histogram depicting respondents' preferences for Teacher Professional Development Programs Should not be Static. It should be Ongoing



Statistics gathered, analyzed and presented on figure 24 was aimed at finding out if participants prefer a teacher professional development program which is ongoing and not static as a measure to maintain sustained connection with the MKO and continuously gain professional knowledge. From the data collected from the field and analyzed revealed that out of the 384 research subjects earlier sampled to take part in this study, 378 of them actually responded to this questionnaire item out and out of the 378 respondents who responded to this questionnaire item, 143 strongly agreed and 78 agreed to the idea that they prefer teacher professional development programs which are continuous and not static. Therefore, a total of 219 out of the 378 participants affirmed that they prefer a teacher professional development program which is continuous and ongoing. On the other hand, 30 of the participants strongly disagreed and 72 of them disagreed, while 57 of the participants were neutral over the questionnaire item that they prefer a teacher professional development program which is ongoing and continuous. In a nutshell, a total of 102 out of the 378 participants expressed a negative view over their preference of a teacher development program that is continuous.

c. Perceived Ease of Use (PEU) and Perceived Usefulness (PU)

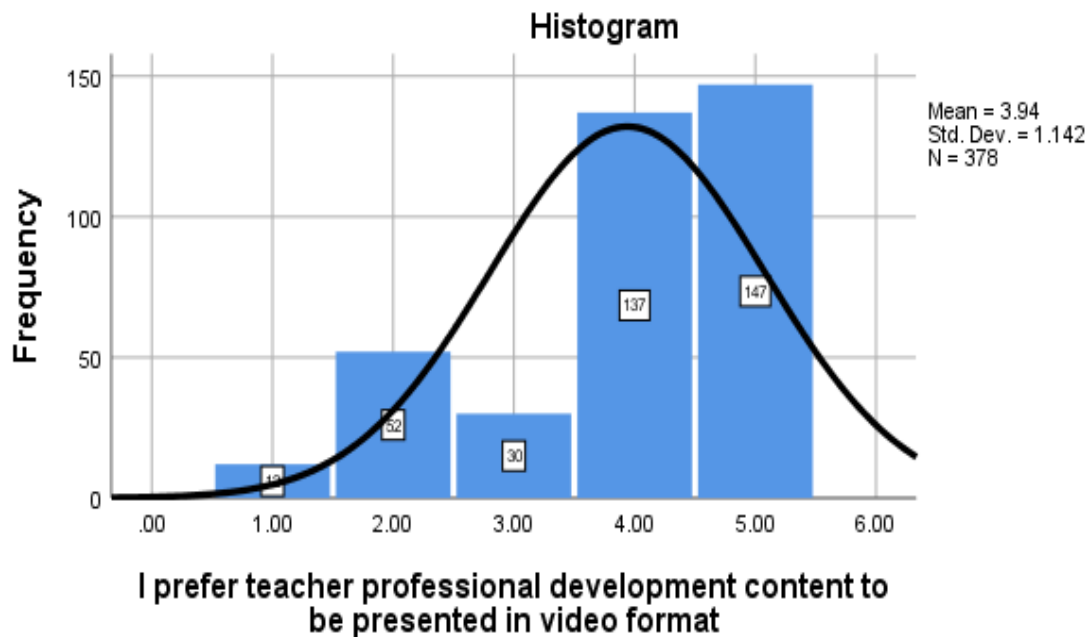
Figure 25: Histogram showing respondents' views of presenting Teacher Professional Development Content using PDF Format



The questionnaire item whose statistics were gathered analyzed and presented on table 25 was aimed at finding out if participants will love content of teacher professional development to be presented in PDF format. In response 224 of the respondents strongly agreed, while 30 of the respondents agreed to the idea that they prefer content of teacher professional development programs to be presented in PDF format. Thus, out of the 378 respondents, 254 of them agreed to the idea that they wish that content of teacher professional development should be presented in PDF format. This preference is due to the fact that teachers will find it easy (PEU) to use PDFs in enhancing their professional development. As well the teachers perceive that PDFs will be useful (PU) in enhancing their professional development.

Contradictorily, 60 of the respondents disagreed while 36 of them strongly disagreed that they wish that the content of teacher professional development should be presented in PDF format. Thus, a total of 96 of the 378 respondents who answered the questionnaire item held a contradictory view while 28 of them held a neutral view over the idea that they wish that content of teacher development program be presented in PDF format.

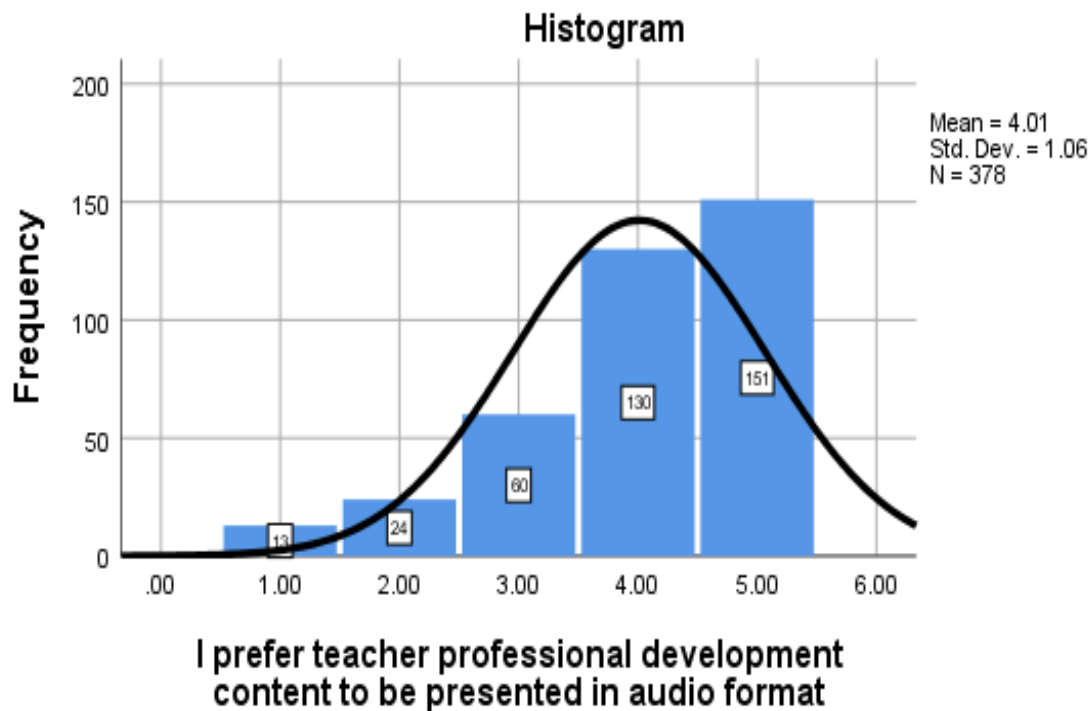
Figure 26: Histogram showing respondents' preferences for Teacher Professional Development Content to be Presented in Video Format



The objective of this questionnaire item whose statistics were gathered, analyzed and presented on figure 26 was to find out if participants prefer that the content of teacher professional

development should be presented in video format. Out of the 384 participants who were sampled for this study, 378 of them effectively answered this questionnaire item. Out of the 378 respondents 147 of them strongly agreed while 137 agreed that they prefer that the content of teacher professional development should be presented in video format. Thus, a total of 287 out of the 378 respondents held the view point that they will prefer that the content of teacher professional development program should be presented in video format. Such a preference is due to the fact that teachers perceive that it will be easy (PEU) for them to access and use pedagogic videos and the pedagogic videos will be useful (PU) in enhancing their professional development. On the other hand, 52 of the respondents strongly disagreed while 12 disagreed that the content of teacher professional development should be presented in video format. Thus, a total of 64 of the 378 respondents who answered this research question held a contrary view while 30 of them held a neutral view over the idea that content of teacher professional development should be presented in video format.

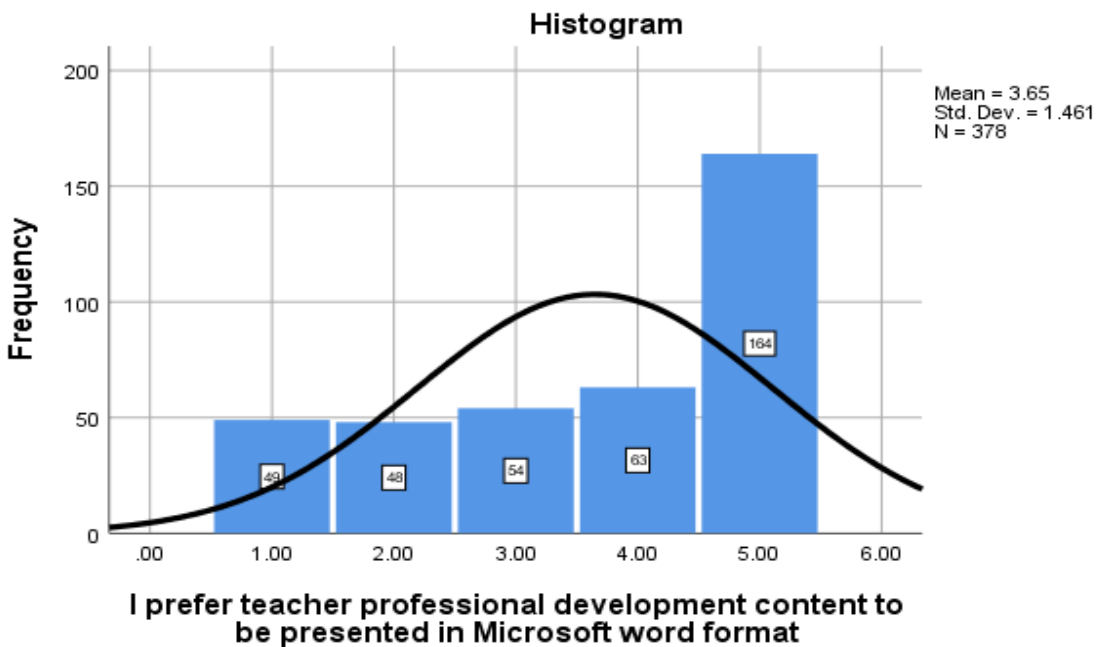
Figure 27: Histogram showing respondents' preferences for Teacher Professional Development Content to be Presented in Audio Format



This questionnaire item whose statistics were gathered, analyzed and presented on figure 27 was aimed at finding out if participants prefer that teacher professional development content should be presented in audio format. The data collected and analyzed revealed that out of the 384 research participants sampled for this study, 378 actually responded to this questionnaire item and out of the 378 respondents, 151 of them strongly agreed and 130 of the respondents agreed that they prefer that teacher professional development content should be presented in audio format. Thus, a total of 281 of the 378 respondents were for the idea that content of teacher professional development should be presented in audio format. Such is due to the fact that Teachers perceive that it will be easy for them to access audio contents (PEU) and that the content will be useful (PU) in enhancing their professional development

On the other hand, 24 of the respondents strongly disagreed and 13 of them disagreed over the fact that content of teacher professional development should be presented in audio format. Therefore, 34 out of the 378 respondents who effectively responded to this questionnaire item were against the fact that the content of teacher professional development should be presented in audio format, while 60 of the 378 respondents had a neutral view over the idea that content of teacher professional development should be presented in audio format.

Figure 28: Histogram showing respondents' preferences for Teacher Professional Development Content to be Presented in Microsoft word Format



This questionnaire item was aimed at finding out if the respondents prefer that content of teacher professional development should be presented in Microsoft word format. The data collected from the field, analyzed and presented on figure 28 showed that 164 of the respondents strongly agreed, while 63 of them agreed to the idea that they prefer that the content of teacher professional development should be presented in Microsoft word format. Therefore, out of the 378 participants who responded to this questionnaire item, 231 of them had a positive view over the idea that content of teacher professional development should be presented in Microsoft word format. Such preference is due to the Perceived Ease of (PEU) and Perceived Usefulness (PU) of Microsoft word.

On the contrary, 48 of the respondents strongly disagreed and 48 of them agreed while 54 of the total respondents were neutral over the idea that the content of teacher professional development should be presented in Microsoft word format. Therefore, out of the 378 respondents, 96 of the total respondents did not agree that content used in enhancing teachers' professional development should be presented in Microsoft word format.

Qualitative Analysis to Answer Research Question Two

To get in depth and clearer information on teachers' preferences in designing a mobile model to enhance teachers' professional development, qualitative data was collected using an open-ended questionnaire item which expected the respondents to express their preferences in the design considerations. The collected data was analyzed using the thematic content analysis and the major findings were grouped under six main themes and presented as follows:

Majority of the respondents in the nationwide survey held the opinion that when designing a teacher professional development program, didactic materials should be introduced in order to render trainings concrete. The participants suggested that manuals, reference materials, audio-visual materials, projected materials should be provided in order to enhance Teachers' Professional Development as one of the participants believes that *Most of it should be taught with teaching aids, concrete handouts given*. And they think that the materials should not be sold to the participants during the training sessions as a participant holds that the *Handouts should be given for free*.

The participants further suggested that they prefer that these materials be provided in multi formats like PDF, word, audio, video, audio-visual amongst others just as a participant thinks that *Chaque enseignement devrait recevoir un document numérique ceci lui permettra d'être intéressé*

, *de mieux s'appliquer dans son domaine* (Each teacher is supposed to receive working materials in digital form, such document will enable the teacher to become more interested and be better trained and be more performant in the discharge of their duties). The participants believe that the use of digital documents will be more beneficial as they held the view point that the use of technology should be the way out for the training of teachers in the twenty first century. They paved the way they suggested that WhatsApp groups should be created to enhance exchange of ideas as well as the use of other forms of video conferences should be used to enhance Teachers' Professional Development. Where such is the case one of the participants think that *Teachers be trained to be computer literate* and where teachers are already trained, another participant holds that they... *be updated on the use of mobile garget*. Yet another believes that android devices should be used in the professional development of teachers, however, the use of android devices should not be automatic as ... *those who dont know how to work with android be guided so that it will facilitate and save working time*.

Moreover, the second emerging theme from the qualitative analysis was learner centeredness of TPD sessions. The participants clearly expressed the view point that they prefer a Teacher Professional Development program which is learner centred as a participant opines that *The in-service training should be learner centered*. Thus, they do not prefer TPD programs in which the facilitators are at the centre of the training process but that which in which the teachers interact amongst themselves to share ideas and learn from best practices under the mentorship of supervisors.

The third major emerging theme is that of needs analysis. The respondents further suggest that before designing the TPD program, the professional needs and aspirations of the teachers should be taken into consideration as a participant is of the opinion that *teachers ideas should be sampled and (training) themes drawn from the difficulties teachers*, concomitantly another participant makes a very strong recommendation by indicating that *The topics chosen should be applicable in Urban, semi Urban, rural and semi rural areas*. This is however, an indicator that the teaching realities vary from one geographical area to another. When the topics are chosen, it should be communicated to the participants before the scheduled training date in order to enable the participants prepare themselves psychologically to assimilate the content as a participant thinks

that the *Topic should be sent to teachers before seminar so that they bring in their ideas and also for better understanding.*

They equally propose that they will prefer that TPD should be done according to the levels in which the teachers teach, so that the particular needs of the teachers of that level are properly addressed. This idea emerged from opinion of a respondent who believes that *...the state should take in to considration the different levels at which teachers teach because teaching level one is different from teaching level two. How then can they just join every body in the same hall. At times they even join level three teachers with nursery school teachers. Are their problems the same?*

Beside grouping teachers according to the levels in which they teach, the participants equally think that the teachers should be grouped according to their training situation as a respondent is of the opinion that organizers of the training sessions should ensure that participants are *grouped in two categories that's trained teachers grouped in a different angle, and untrained teachers in another angle so that emphases can be laid profoundly in untrained teachers.*

Besides, the fourth emerging theme for teachers' preferences in the design consideration of Teachers; professional development package is that of proper planning. The respondents believe that participants should carry out proper planning prior to the holding of teacher professional development sessions so as to avoid any form of failure and or disgruntlement from teachers. By so doing, the participants are unanimous as they think that the venue of the training is of utmost importance as far as security, accessibility and convenience are concerned. They further believe that if information about the training is made available to the teachers in ample time, it will maximize the profitability of the training session. As well sufficient time should be allocated to handle the chosen topics as a participant thinks that convenors of Teacher Professional Development Sessions should *Chose a secured venue, information on seminar be sent earlier, schedule enough time for each topic during presentation.* Some of the respondents even held the view point that as far as venue is concerned, training sessions should hold in the localities of the teachers and not solely in urban centres as one of the respondents believe that *It should be held in the rural areas because most teachers find it difficult to move from their local area to attend seminar and lodging is also a factor to consider.* To support this view point, another respondent thinks that *Logistics should be taken care of. The venue should be conducive in terms of comfortable seats, ventilation and the presenters should do peer review before come to present.*

This thus points to the fact that besides preparation of the physical environment, the presenters should also prepare themselves cognitively to face the task attributed to them by carrying out peer reviews so as to avoid contradicting each other and confusing the participants during the various training sessions.

Moreover, the fifth emerging theme on teachers' preference in the design consideration of a TPD package from the nationwide survey is that of timing for TPD training session. During the survey, the teachers expressed the view points that Teacher Professional Development training sessions should be carried out during appropriate periods of the school year. Precisely, the respondents think that TPD trainings should be done every term as one of them believes that *If in-service training of teachers can be carried out terminally it will be good so that the teachers brains are refreshed always*. Inasmuch as TPD should be done once a term as preferred by the respondents, another respondent thinks that *The time and the period allocated should be the one that will not disrupt class activities*. In proposition of a suitable period, another respondent advocates that TPD sessions *should be done during holidays and not school hours*. As far as duration of the each training session is concerned participants hold that it should span beyond just one day as one of them think that *...One day in-service training is insufficient to handle everything probably. Sometimes teachers abandoned the seminar as if they came to answer present*. Thus, beside the period allocated for TPD, this participant thinks that certain measures should be adopted to enable teachers stay on and complete each module of the training session. Such measures have been proposed in emerging theme six of this section of this study.

The Sixth emerging theme of teachers' preference in the design consideration for TPD package is that of motivation. The respondents hold the view point that for teachers to actually participate and gain knowledge in the Teachers' Professional Development sessions some sort of motivation should be attributed to the teachers as one of the respondents expresses the view point that *...teacher's motivation should be taken into consideration* when carrying out TPD activities. Others think that the motivation should be in the form of remuneration as a participant holds that *Il faut rémunérer les sessions de formation* (training sessions should be remunerated) in the absence of a significant remuneration, the participants hold that certain basic motivations should not be undermined as a participant think that *Teachers should be motivated. If not at least by providing the basic needs such as taxi faire*. In a situation where the liquid cash is not available

to pay for the transportation fair of the teachers, another respondent suggests that *Transportation should be available*.

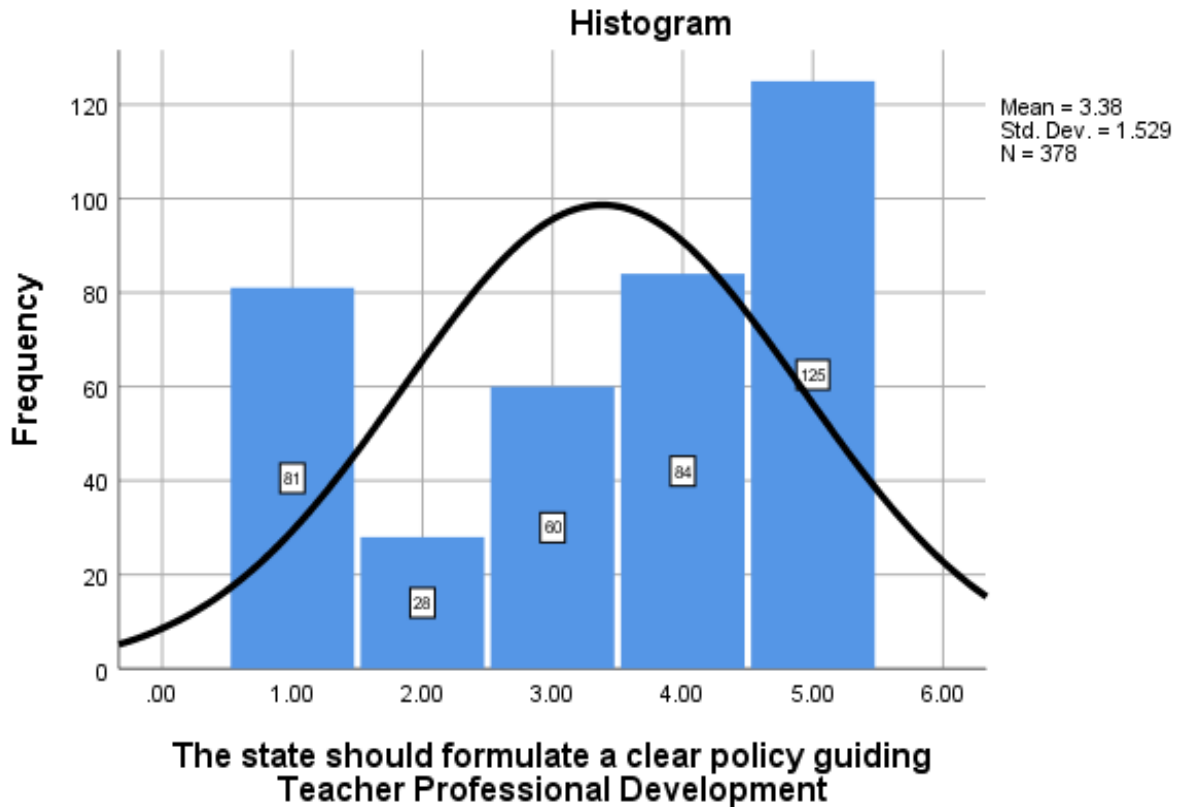
Research Question 3: What Policy Orientation Should Guide the Use of Mobile Learning in Enhancing Teachers' Professional Development?

This research Question sought to find out policy orientation that should guide the introduction of mobile learning in enhancing teachers' professional development. To have ample information on this, both quantitative and qualitative data were collected, analyzed and presented in this section of the study.

Quantitative Analysis of Research Question three

The qualitative analysis was collected using a set of closed ended questionnaire items found on section C of the research instrument. The data was analyzed and the findings presented in this section of the study according to the various items of the corresponding section.

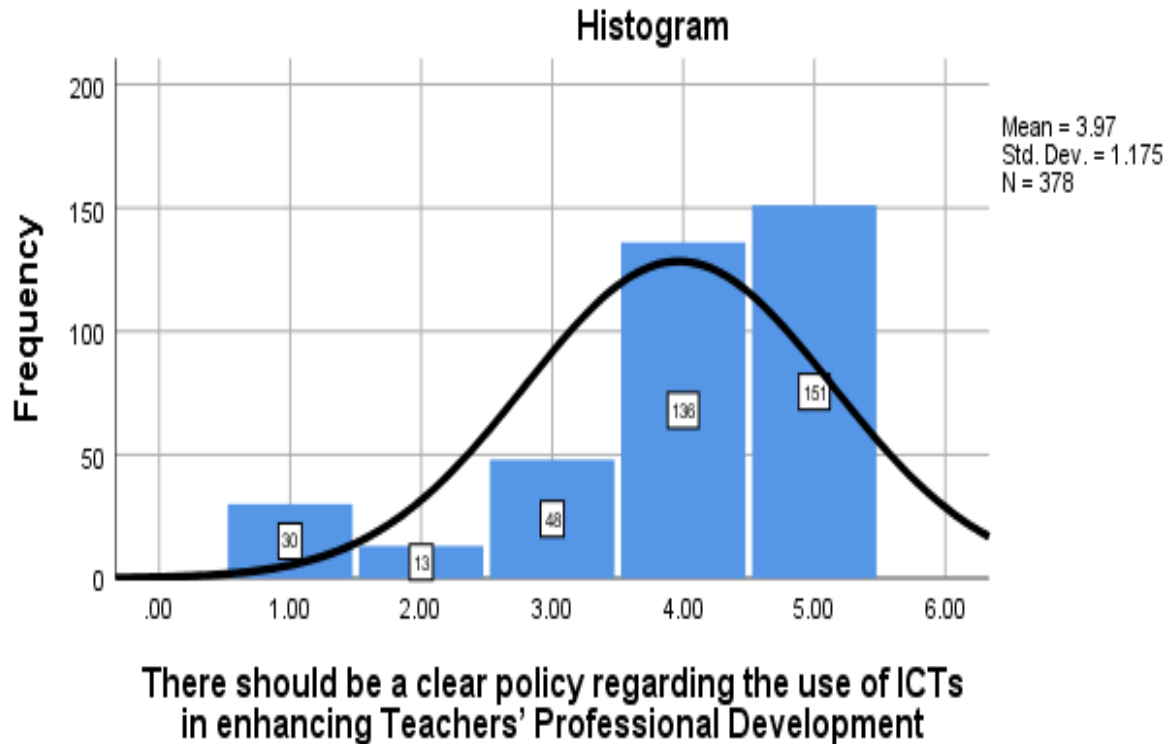
Figure 29: Histogram depicting respondents' views that state should formulate a clear policy guiding Teacher Professional Development



This questionnaire item whose statistics were gathered and presented on figure 29 sought to find out if the participants desire that the state should formulate a clear policy guiding teacher professional development. Data gathered from the field and analyzed showed that out of the 384 participants sampled for this study, 378 of them actually responded to this questionnaire item and out of the 378 respondents who responded to this questionnaire item, 125 strongly agreed and 84 of them agreed that they will wish that the state should formulate a clear policy regarding the professional development of teachers. Therefore, a total of 209 of the 378 respondents affirmed that the state should formulate a clear policy guiding teacher professional development.

By contrast, 28 of the respondents strongly disagreed while 81 of them disagreed to the idea that the state should formulate a clear policy guiding teacher professional development. Therefore, out of the 378 respondents who responded to this questionnaire item, 109 of them held a contrary view while 28 of the total respondents were neutral over the idea that the state should formulate a clear policy guiding teacher professional development?

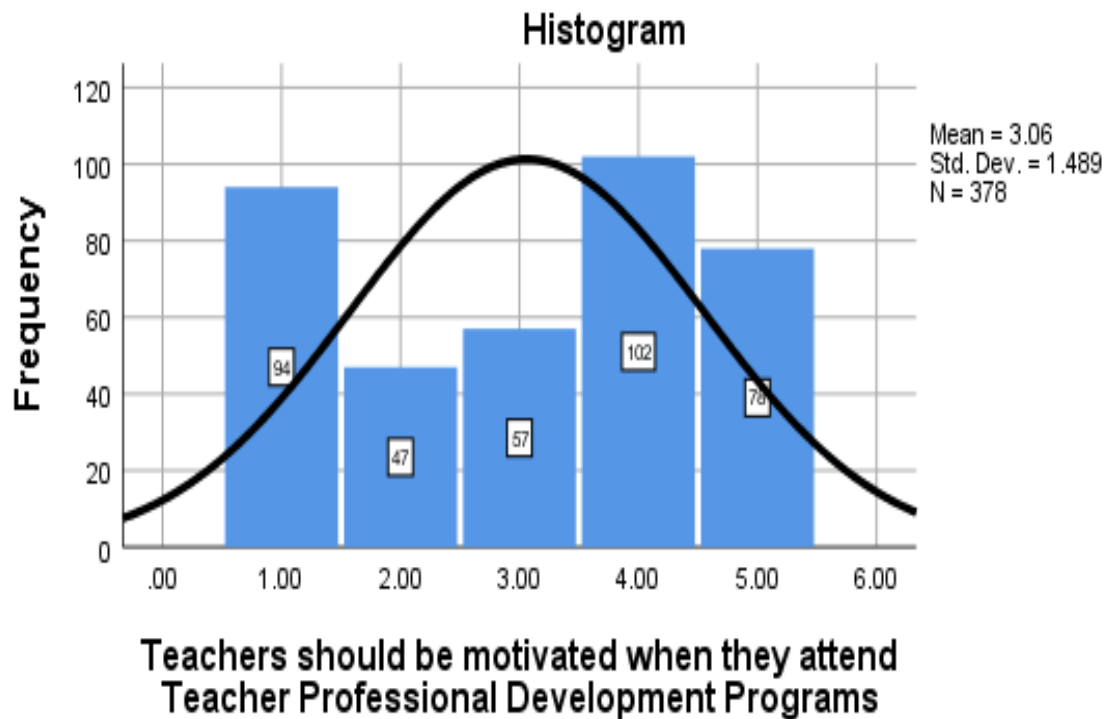
Figure 30: Histogram depicting respondents' views that there should be a clear policy regarding the use of ICTs in enhancing Teachers' Professional Development



The questionnaire item whose data was collected, analyzed and presented on figure 30 was to find out the stand point of participants as to whether there should be a clear policy regarding the use of ICTs in enhancing Teachers' professional development. Data collected from the field and analyzed revealed that out of the 384 who were sampled to take part in this study, 378 of the respondents actually responded to this questionnaire item, 151 of the strongly agreed while 136 of the respondents agreed that there should be a clear policy regarding the use of ICTs in enhancing Teacher's professional development. Therefore, a total of 287 adhered to the idea that there should be a clear policy regarding the use of ICTs in enhancing teachers' professional development.

Opposing, 13 of the respondents strongly disagreed and 30 disagreed, while 48 obtained a neutral view point on the idea that there should be a clear policy guiding the use of ICTs in enhancing Teachers' Professional Development. In a nutshell, a total of 43 out of the 378 respondents who responded to this item refuted the idea that there should be a clear policy guiding the use of ICTs in enhancing the professional development of teachers.

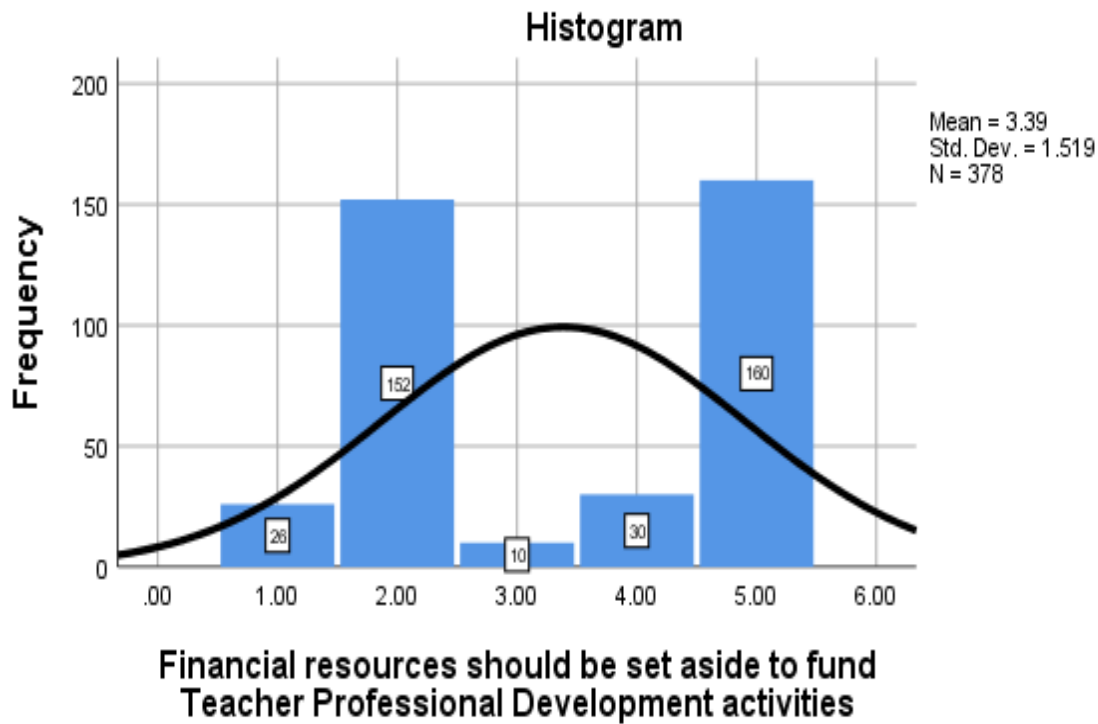
Figure 31: Histogram showing respondents' views that Teachers should be motivated when they attend Teacher Professional Development Programs



This questionnaire item whose statistics were collected and presented on figure 31 sought to find out the view of participants if the teachers should be motivated when they attend teacher professional development programs. The data gathered from the field and analyzed, revealed that out of the 378 respondents of the 384 respondents effectively responded to this questionnaire item, out of whom 78 of them strongly agreed and 102 agreed to the idea that teachers should be motivated when they attend teacher professional development program. Thus, a total of 180 of the 378 respondents adhered that teachers should be motivated when they attend teacher professional development programs.

Contradictorily, 47 of the respondents strongly disagreed and 94 disagreed, while 57 of the respondents were neutral over the idea that teachers should be motivated when they attend teacher professional development programs. In a nutshell, a total of 141 of the 378 respondents who responded to this questionnaire item held a negative view over the idea that teachers should be motivated when they attend teacher professional development program.

Figure 32: Histogram depicting respondents' views that financial resources should be set aside to fund Teacher Professional Development activities

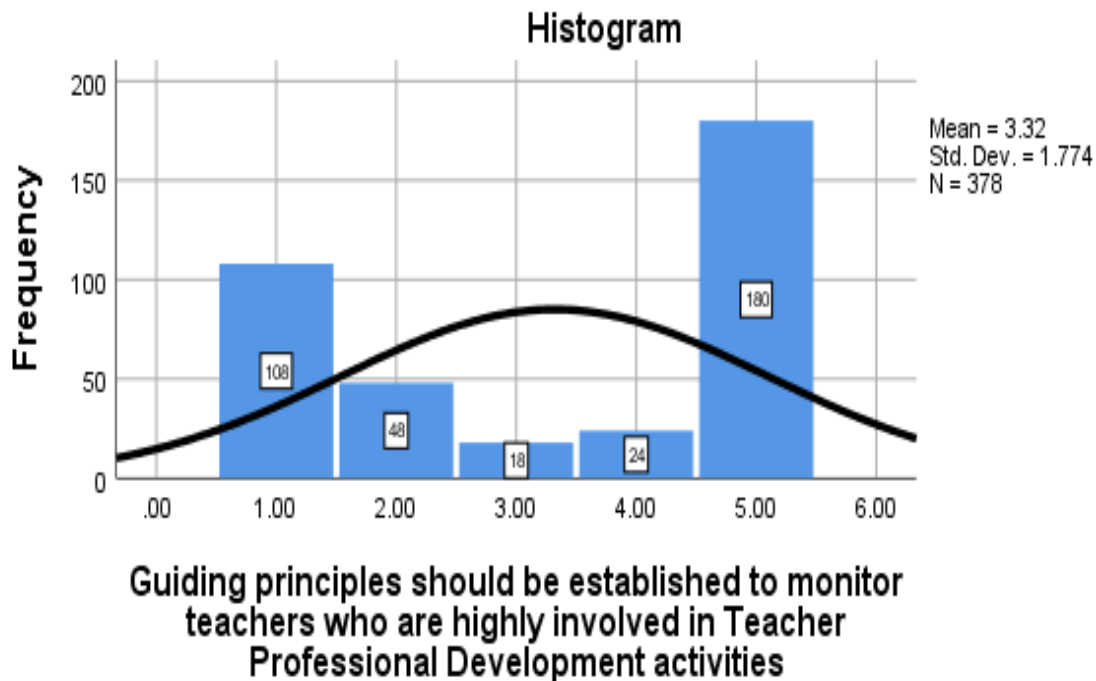


This questionnaire item whose statistics are presented on figure 32 sought to find out the viewpoints of participants as to whether the state should allocate financial resources to fund teacher professional development. Data gathered from the field and analyzed pointed to the fact that out of the 384 sampled population for this study, 378 of the respondents who responded to this questionnaire item, 160 of them strongly agreed while 30 agreed that financial resources should be set aside to fund teacher professional development activities. Therefore, a total of 190 Of the 378 participants affirmed that financial resources should be set aside to fund teacher professional development activities.

Contrarily, out of the 378 participants who responded to the questionnaire item, 153 strongly disagreed while 28 disagreed and 10 were neutral over the idea that funds should be set aside to finance teacher professional development activities. In a nutshell a total of 181 of the 378

respondents held a negative view over the idea that financial resources should be set aside to fund teacher professional development activities.

Figure 33: Histogram depicting respondents' views that guiding principles should be established to monitor teachers who are highly involved in Teacher Professional Development activities

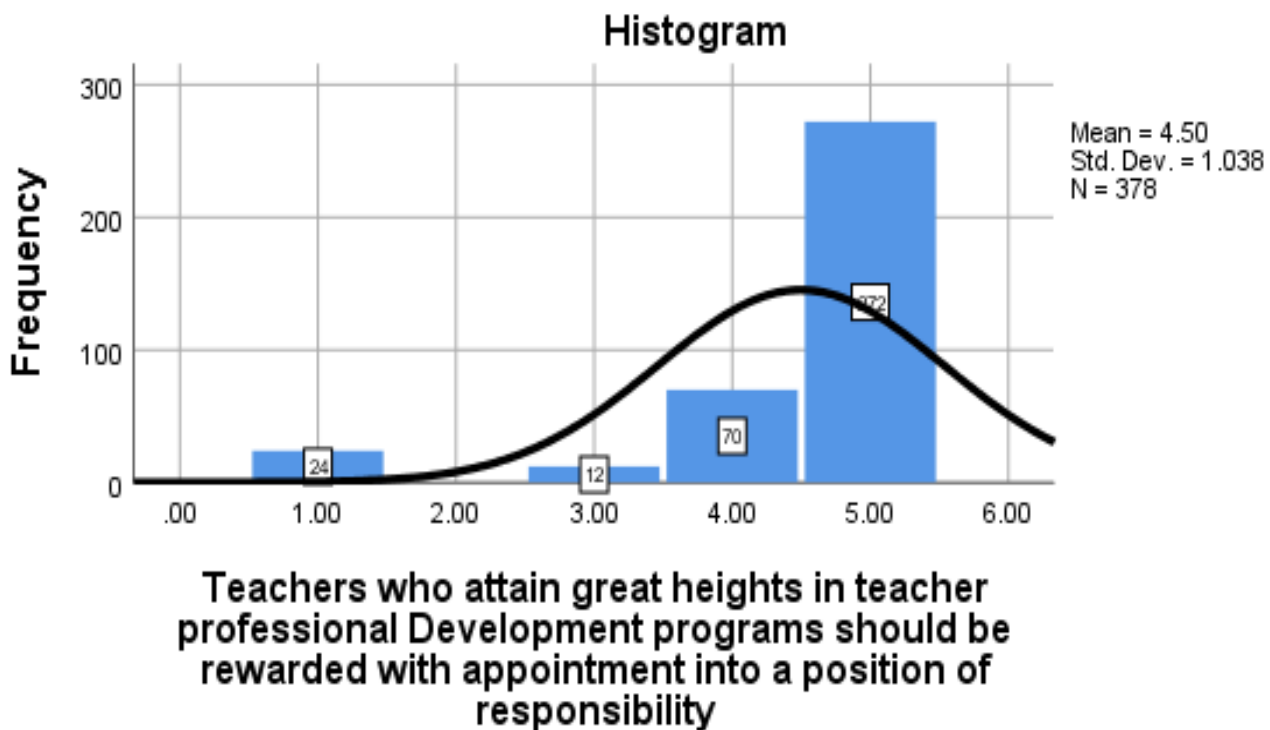


This questionnaire item whose statistics are presented on figure 33 had as objective to find out participants' view as to whether guiding principles should be established to monitor teachers who are highly involved in teacher professional development activities. Data gathered and analyzed revealed that out of the 378 participants who responded to this questionnaire item, 180 strongly agreed and 24 agreed that guiding principles should be prescribed to monitor teachers who are highly engaged in teacher professional development activities. Thus, a total of 204 out of the 378 participants who responded to this questionnaire item affirmed that guiding principles should be set aside to monitor teachers who are taking teacher professional development activities seriously.

By contrast, 48 strongly disagreed and 108 disagreed while 18 of the participants were neutral over the idea that guiding principles should be prescribed to monitor teachers who are highly involved in teacher professional development activities. Thus, total of 156 out of the 378

respondents did not agree that a guiding principle should be established to monitor teachers who are highly engaged in teacher professional development activities.

Figure 34: Histogram depicting respondents' views that teachers who attain great heights in teacher professional Development programs should be rewarded

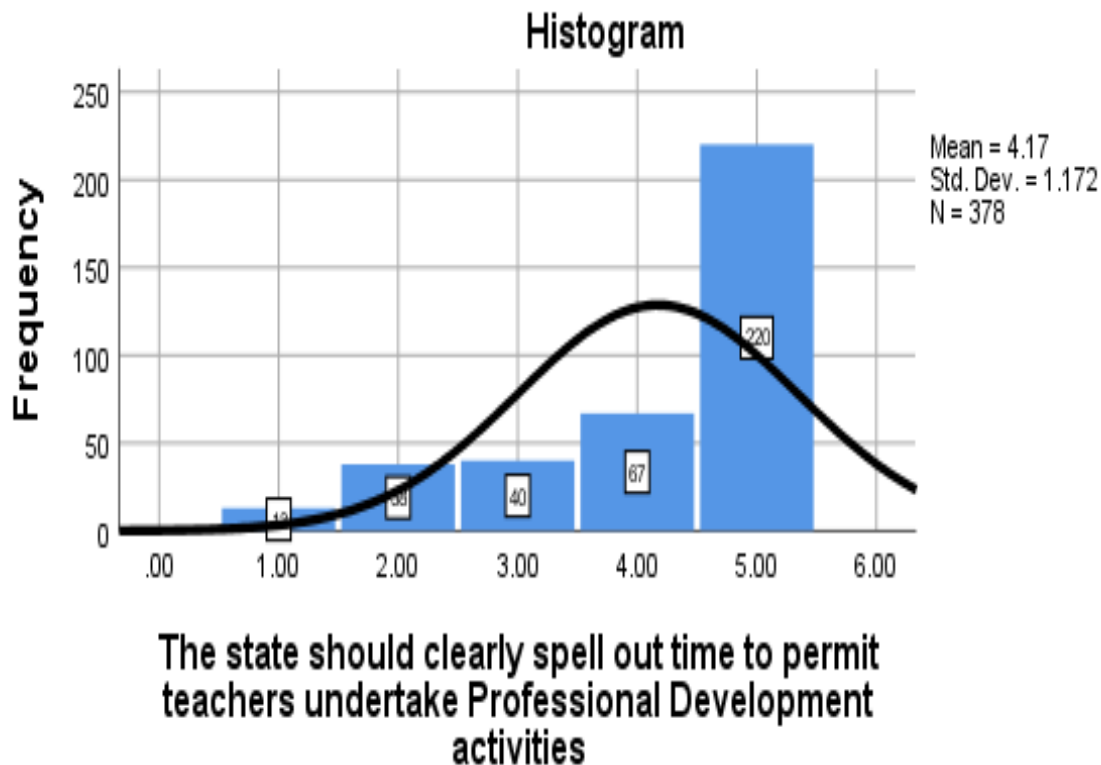


This questionnaire item whose statistics are presented on figure 34 sought to find out if teachers who attain great heights in teacher professional development programs should be rewarded. The data collected and analyzed revealed that out of the 378 out of the 384 participants who responded to this questionnaire item, 272 strongly agreed and 70 agreed that teachers who attain great heights in teacher professional development programs should be rewarded. Therefore, a total of 342 of the 378 respondents held an affirmative view that teachers who attain great heights in the teacher professional development programs should be rewarded.

On the other hand, 0 participant strongly disagreed while 24 disagreed and 12 of the participants obtained a neutral stand point over the idea that teachers who attain great heights in teacher professional development programs should be rewarded. Therefore, a total of 24 out of the 378

participants held a negative view on the idea that teachers who attain great heights in the teacher professional development programs should be rewarded.

Figure 35: Histogram showing respondents' views that the state should clearly spell out time to permit teachers undertake Professional Development activities

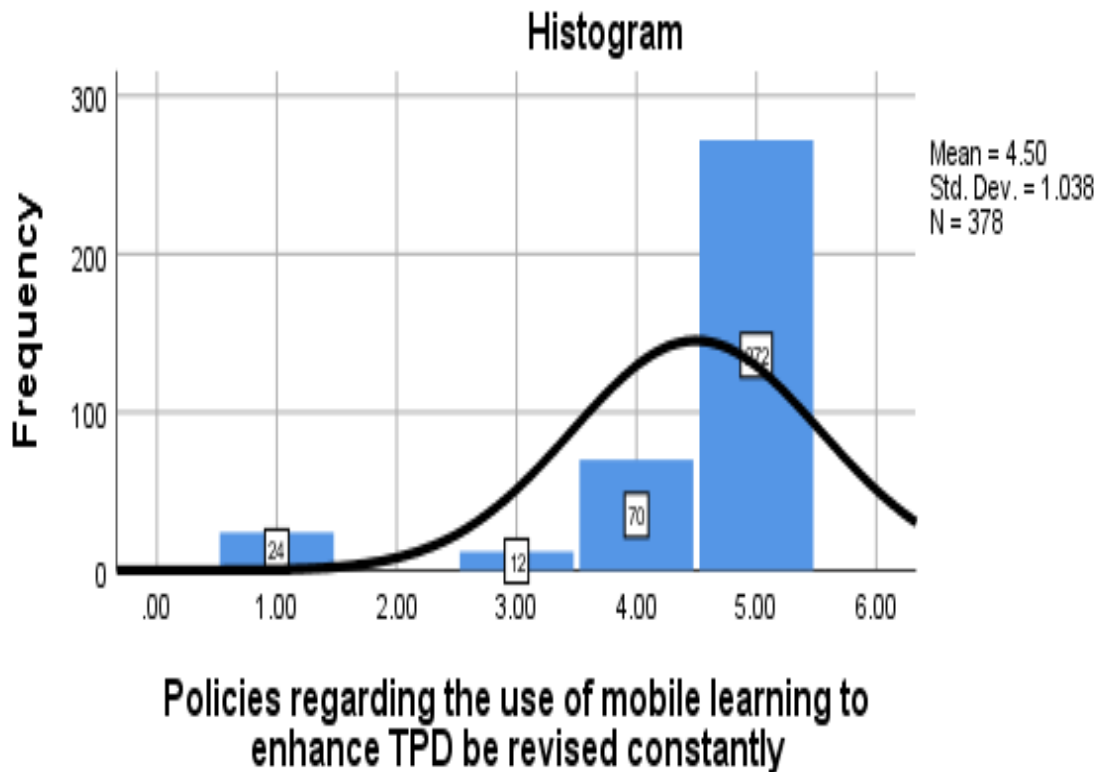


This questionnaire item whose statistics are presented on figure 35 sought to find out the view point of participants as to whether the state should clearly spell out time to permit teachers undertake professional development activities. Data gathered from the field and analyzed revealed that 378 out of the 384 respondents who responded to the questionnaire item, 220 of them strongly agreed and 67 of the respondents agreed that the state should clearly spell out time to permit teachers undertake professional development activities. Therefore, a total of 287 of the 378 respondents affirmed that the state should clearly spell out time to permit teachers undertake professional development activities.

Contradictorily, 13 of the participants strongly disagreed and 38 disagreed and 40 held a neutral view point on the idea that the state should clearly spell out time to permit teachers undertake professional development activities. Therefore, a total of 51 out of the 378 respondents who

effectively answered this item refused the idea that the state should clearly spell out time for teachers to undertake teacher professional development activities.

Figure 36: Histogram showing respondents' views that policies regarding the use of mobile learning to enhance TPD be revised constantly



The objective of this questionnaire item whose statistics are presented on figure 36 was to find out the views of participants as to whether policies regarding the use of mobile learning to enhance teachers' professional development should be revised constantly. Data collected from the field and analyzed showed that 378 out of 384 respondents who responded to this questionnaire item, 272 of the respondents strongly agreed while 70 of them agreed that policies regarding the use of mobile learning in enhancing teachers' professional development should be constantly revised. Therefore, a total of 342 out of the 378 respondents affirmed that policies regarding the use of mobile learning to enhance teacher professional development should be enhanced constantly.

On the other hand, 0 of the respondents strongly disagreed and 24 of the respondents disagreed while 12 of the respondents held a neutral view over the idea that policies regarding the use of mobile learning in enhancing teacher professional development should be constantly revised.

Qualitative Analysis to answer research question three

From the findings gotten from the quantitative analysis on what policy orientation should guide the implementation of mobile learning in enhancing Teachers' Professional Development, qualitative data was also collected through an open-ended item which requested participants to mention other policy orientations which could effectively guide the implementation of Teacher Professional Development activities. The data gathered was analyzed using the thematic content analysis and presented under seven major emerging themes as follows:

The first major emerging theme as far as policy orientation is concerned is that of timing. Such is the case as many of respondents expressed the view point that the government should clearly spell out time during which Teacher Professional Development activities can take place as a participant thinks that there should be the *Organisation des formations continues tous les trimestres* (organisation of Professional Development every term). Another participant thinks that once a term is insufficient and proposes that TPD should be done in a manner in which teachers should *Travailler sur un thème une fois le mois* (Work on one theme once a month). Thus, according this respondent, TPD should hold once every month. They equally held the view point that TPD activities should be continuous, ongoing and regular as one of the participants notes that the state should make it a policy for teacher educators to *Multiplier les séminaires de formation* (multiply training seminars). Therefore, the underlining factor is that the state should make it a policy that Teachers' Professional Development activities should be continuous and ongoing throughout the school year.

The second emerging theme as far as policy orientation is concerned is that of the appropriate use of didactic materials during training sessions. The participants think that the state should make it a policy that didactic materials should be used during professional Development of teachers. The participants opine that the state should make it a policy for technological gadgets to be used as support materials during face-to-face Teacher Professional Development activities as well as a means through which TPD contents are disseminated as one of the participants expresses the view point that *Teaching equipment such as computers, musical instruments, image*

projections to enhance and facilitate teaching learning process during Teacher Professional Development activities as such one of the participants hold that they expect the state to put in place *Policies regarding the use of audio visual aids ...* In situations where technology will be used as a means through which the contents of TPD will be disseminated, the participants hold that the state should make a policy which will guide their training of the use of the technology as a participant thinks that prior to the use of technology, the state has to *Mise sur pied d'une session de formation à l'utilisation des outils TIC* (put in place a training session to train participants on the use of ICT tools). In such a situation, the participants think that the state is to make a policy which will favour the provision of the needed ICT tools to teachers. An example of such a policy according to one of the respondents is to *Provide teachers with android phones*.

Furthermore, the third emerging theme as far as teachers' proposal on a policy that will guide the proper implementation of Teacher Professional Development is that of lack of mastery of content by TPD providers. Thus the respondents think that the state should promulgate a policy that will ensure that the quality of the presenters during Teacher Professional Development programs as one of the respondents held that *The government should make sure that those put in charge of these in-service training are well experienced and master their subjects*. This is because the participants think that at times, the presenters of the TPD contents do not master their subject matter as a respondent decries that *The inspectors should first of all be made to understand what they want to come and teach teachers. There are some inspectors who just go and cram things to be telling teachers. When the teachers ask them a simple question, they will not be able to answer and the other inspectors will just start confusing people*. Thereby suggesting that beside content mastery, the TPD facilitators are supposed to be unanimous in their ideas before proceeding to deliver the planned content.

Moreover, the Fourth major emerging theme on policy orientation to guide the effective implementation of TPD is that of motivation. The participants during the nationwide survey postulate that the state should clearly formulate a policy to guide the motivation of teachers who attend professional development activities. Such is the case as one of the research participants think that the state should formulate TPD policies that will *Encourager les travailleurs et décourager davantage les paresseux* (Encourage those who work hard and discourage lazy ones) by so doing a participant thinks that the state should formulate a policy in which promote the idea

that *Teachers who reach great heights in teacher development programs should be rewarded with appointment to a leadership position.*

Besides appointments, the participants think that another form of motivating them to attend TPD programs is by awarding certificates of participation to teachers who actually take part in TPD exercise as a participant proposes that *The government should make a policy to issue attendance certificate.* However, there should be some criteria on how the the attendance certificates shall be awarded as one of the research participants thinks that *An attestation or certificate be awarded to teachers who have successfully completed In-service trainings for a period of time as deemed necessary by the government.and this certificate should be a track records for appointments and promotions.* Therefore, a clear policy should be formulated guiding the certificate award process.

In addition, the respondents also think that to motivate teachers to take part in TPD activities, the state should formulate policies on how financial resources should be attributed to the participants of the TPD programs. This is justified as one of the participants clearly hold the view point that *There should be financial allocation for teachers to use during in-service training for transportation and upkeep.* To do this, another respondent proposes that that policy should be that which stipulates that *Any financial dues for participants shall be signed out by the concerned in a nearby treasury to avoid avoid cheating.*

The fifth major emerging theme as far as policy orientation to guide the proper implementation of TPD programs is that of analysis. Thus, the respondents also suggested that the state should formulate a clear policy on how needs analysis of TPD should be done. This according to them is due to the fact that the present model of TPD used in Cameroon does not really take the teachers' professional needs into consideration during planning as one of the respondents holds that TPD facilitators should *Give open opportunities for teachers to come up with topics they're facing difficulties.* The respondents thus suggest that the policy should clearly state that the designed TPD training sessions should be geared towards resolving problems faced by teachers in the discharge of their duties and not just a mere means of carrying assigned administrative and supervisory functions.

Research Question Four: What is the performance of Participants after Participating in a Mobile Learning Program?

In a bid to answer research question four of this study, which sought to find out the performance of teachers after taking part in a mobile learning exercise designed through the Mobile Model for Teacher Professional Development, a cohort of fifty teachers out of the total 384 teachers who took part in this study participated in this phase of this research project as the experimental group.

To begin the training process, needs analysis was carried out amongst the fifty participants of the experimental group. The purpose of the needs analysis was as a result of information gotten from literature which was in line with the expressed view of the participants who indicated from the findings gotten from research question two of this study that they wish that their professional needs and aspirations be taken into consideration when designing training packages to enhance their professional development.

The needs analysis was thus conducted through a set of closed ended questionnaire developed using the five point likert scale. The whereby the respondents were requested to decide if they strongly agreed, agreed, were neutral or disagreed and strongly disagreed to each of the questionnaire items which were related to issues on lesson planning. At the end of the needs analysis process, data was collected, analyzed and presented on table 7.

Table 7: Needs Analysis for IMT training

Statement	SA	A	D	SD	N	Total
Will you like to be trained on how to write the preamble of an individual lesson plan?	0 (0%)	31 (78%)	2 (5%)	0 (0%)	7 (18%)	40 (100%)
Will you like to have training on writing of instructional Objectives?	0 (0%)	37 (93%)	2 (5%)	0 (0%)	1 (3%)	40 (100%)
Will you like to be trained on the stages of lesson planning?	0 (0%)	32 (80%)	1 (3%)	0 (0%)	7 (18%)	40 (100%)
Do you wish to be trained on evaluation strategies?	0 (0%)	38 (95%)	0 (0%)	0 (0%)	2 (5%)	40 (100%)
Will you like to be trained on instructional methods?	0 (0%)	39 (98%)	0 (0%)	0 (0%)	1 (3%)	40 (100%)
Multiple response set	0 (0%)	177 (89%)	5 (3%)	0 (0%)	18 (9%)	200 (100%)

The statistics presented on table 7 reveals that out of the forty participants, none (0%) of them strongly agreed that they will like to be trained on how to write the preamble of an individual lesson plan while 31 (78%) of the participants agreed that they will like to be trained on how to write the preamble of an individual lesson plan and 7 (18%) of the were neutral over the idea. Contradictorily, 0 (0%) of the 40 respondents strongly disagreed that they will like to be trained on how to write the preamble of an individual lesson plan, while 2 (5%) of the 40 participants disagreed that they will like to be trained on how to write the preamble of an individual lesson plan.

The second needs analysis item on the questionnaire sought to find out if participants will like to have training on how to write instructional objectives. The findings showed that out of the 40 respondents of the questionnaire item, 0 (0%) of them strongly agreed to be trained on how to write instructional objective while 37 (93%) of them agreed that they will like to be trained on the

setting of instructional objectives and 1(3%) of the respondents observed a neutral stand point on the idea. Contradictorily, 0 (0%) of the respondents strongly disagreed to be trained on how to set instructional objectives while 2 (5%) of the respondents disagreed that they will like to be trained on how to write instructional objectives.

The third item on the needs analysis questionnaire sought to find out if participants will like to be trained on the stages of lesson planning. The findings revealed that out of the 40 respondents, 0 (0%) of them strongly agreed that they will like to be trained on the various stages of a lesson plan, while 38 (98%) of them agreed that they will like to be trained on how to prepare the various stages of a lesson plan and 2 (5%) of them held a neutral view point. On the other hand, 0 (0%) strongly disagreed that they will like to be trained on how to prepare the various stages of a lesson plan and 0 (0%) disagreed over the idea.

The fourth questionnaire item on the needs analysis questionnaire sought to find out if participants will like to be trained on instructional methods. The findings revealed that out of the 40 participants who responded to the questionnaire item, 0 (0%) of the respondents strongly agreed that they will like to be trained on instructional methods, while 39 (98%) of the respondents agreed that they will like to be trained on instructional methods and 1(3%) was neutral over the idea. On the other hand, 0 (0%) of the respondents strongly disagreed over the idea that they will like to be trained on instructional methods while 0 (0%) disagreed over the idea.

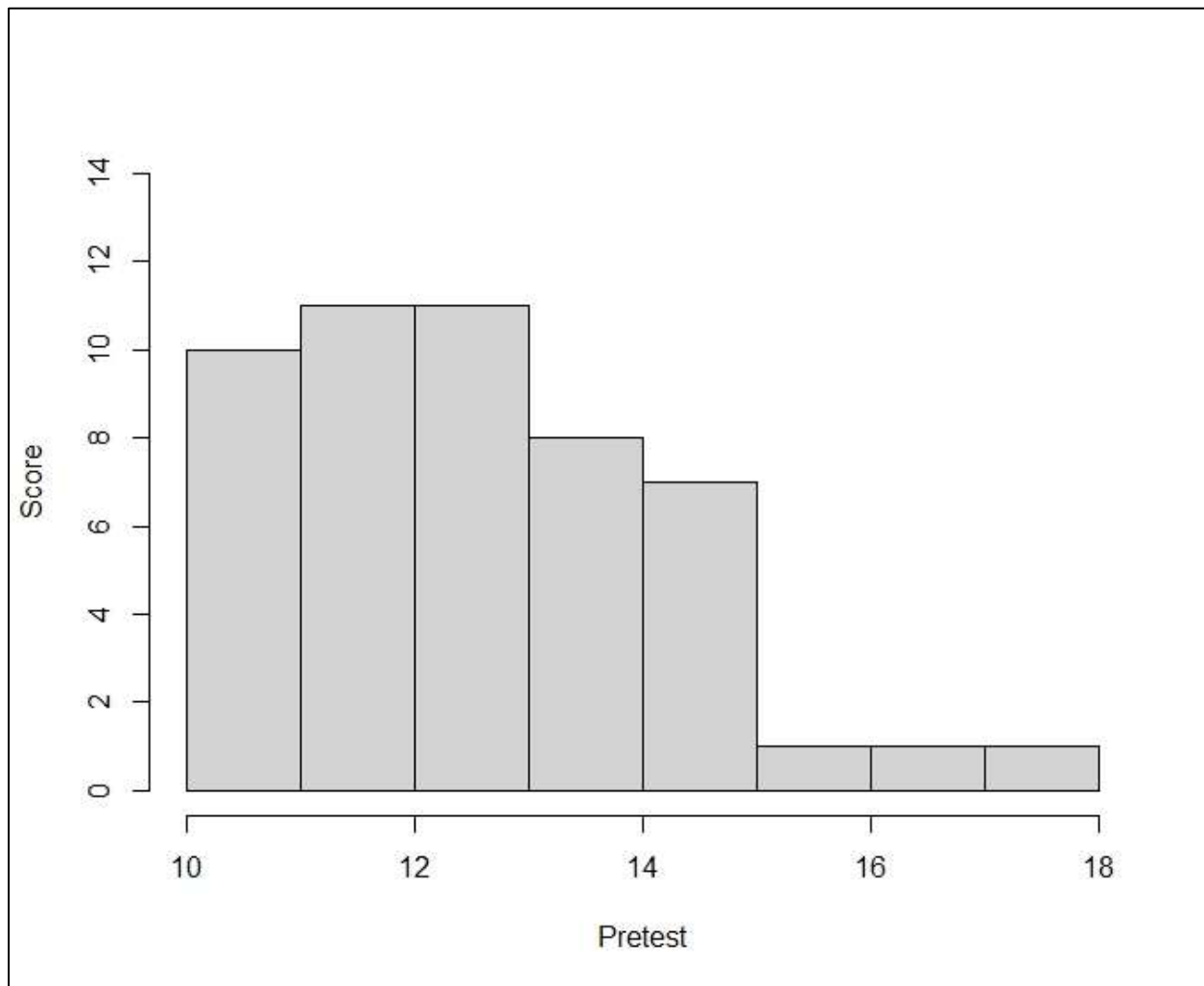
From the foregoing analysis, it can be ascertained that a great majority of the respondents agreed that they will like to be trained on how to prepare the preamble of an individual lesson plan, how to state instructional objectives, prepare the various stages of an individual lesson plan and be trained on instructional methods.

The Pretest Process

From the findings gotten from the needs analysis it was ascertained that the participants expressed the need to be trained in lesson planning. To further ascertain their professional needs in lesson planning, they were given a pretest was based on lesson planning. The participants were requested to prepare a complete lesson plan. The purpose of the pretest was to identify their weaknesses as far as lesson planning is concerned so as to use the difficulties to build up the training package. The pretest scores were also needed in order to be used to ascertain the performance of the participants after the post test. At the end of the pretest, the lesson plans were

collected and marked. The performance of the participants was analyzed and presented on figure 4.30.

Figure 37: *Performance of Teachers during the pretest*



The histogram presented on figure 37 shows the distribution of the scores of the teachers during the pretest. At a glance, it can be noticed that most of the participants scored from 10 – 15 points on a scale of 20 and only a few scored above 15 points on a scale of 20. A closer look reveals that the majority scored between 11 to 13 points on a scale of 20.

The Post Test Process

After the pretest, a post test was conducted. To do this, a five-module training package was drawn up using the stipulations of the Interactive Mobile Technology (IMT) Model of Teacher Professional Development developed in chapter two of this study to meet the expressed professional needs of the participants. The five weeks training was organized as follows:

Table 8: Training Module for Mobile Model for Teacher Professional Development

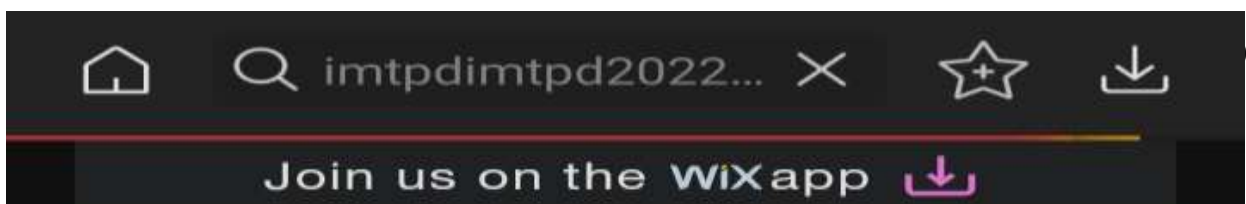
PERIOD	MODULE	SPECIFIC OBJECTIVES	MODE OF DELIVERY
WEEK 1	Training on the use of the Teacher professional Development mobile platform	From a mobile platform on TPD through explanation, interactions and practice by the end of the module, participants should be able to conveniently use the TPD mobile platform conveniently.	Face-to -face
WEEK 2	Preamble of an individual lesson plan	From videos and a text on the preamble of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to; <ul style="list-style-type: none"> - State the elements of a preamble of an individual lesson plan - Write the preamble of an individual lesson plan 	online
	Setting Instructional Objectives	From the criteria of setting instructional objectives, through discussions, presentations and questioning, by the end of the module, participants will be able to:	Face-to -face

		<ul style="list-style-type: none"> - State the criteria of setting instructional objectives - State an instructional objective clearly 	
Week 3	Teaching Methods	From illustrations and demonstrations, by the end of the training, participants should be able to effectively use teaching methods in the instructional process	Face-to-face
Week 4	Introduction/Revision stage of an individual lesson plan	<p>From videos and text on the revision stage of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to;</p> <ul style="list-style-type: none"> - Explain the 2 types of revision to be carried by a teacher - Prepare the revision stage of an individual lesson plan 	online
Week 5	The Presentation stage of an individual lesson plan	<p>From videos and text on the presentation stage of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to;</p> <ul style="list-style-type: none"> - State the sub stages of the presentation stage of an individual lesson plan 	online

		- Draw the presentation stage of an individual lesson plan	
Week 6	Evaluation stage of an individual lesson plan	From videos and a text on the evaluation stage of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to; <ul style="list-style-type: none"> - Explain the link between the specific objectives and the evaluation stage of an individual lesson plan - Prepare the evaluation stage of an individual lesson plan 	

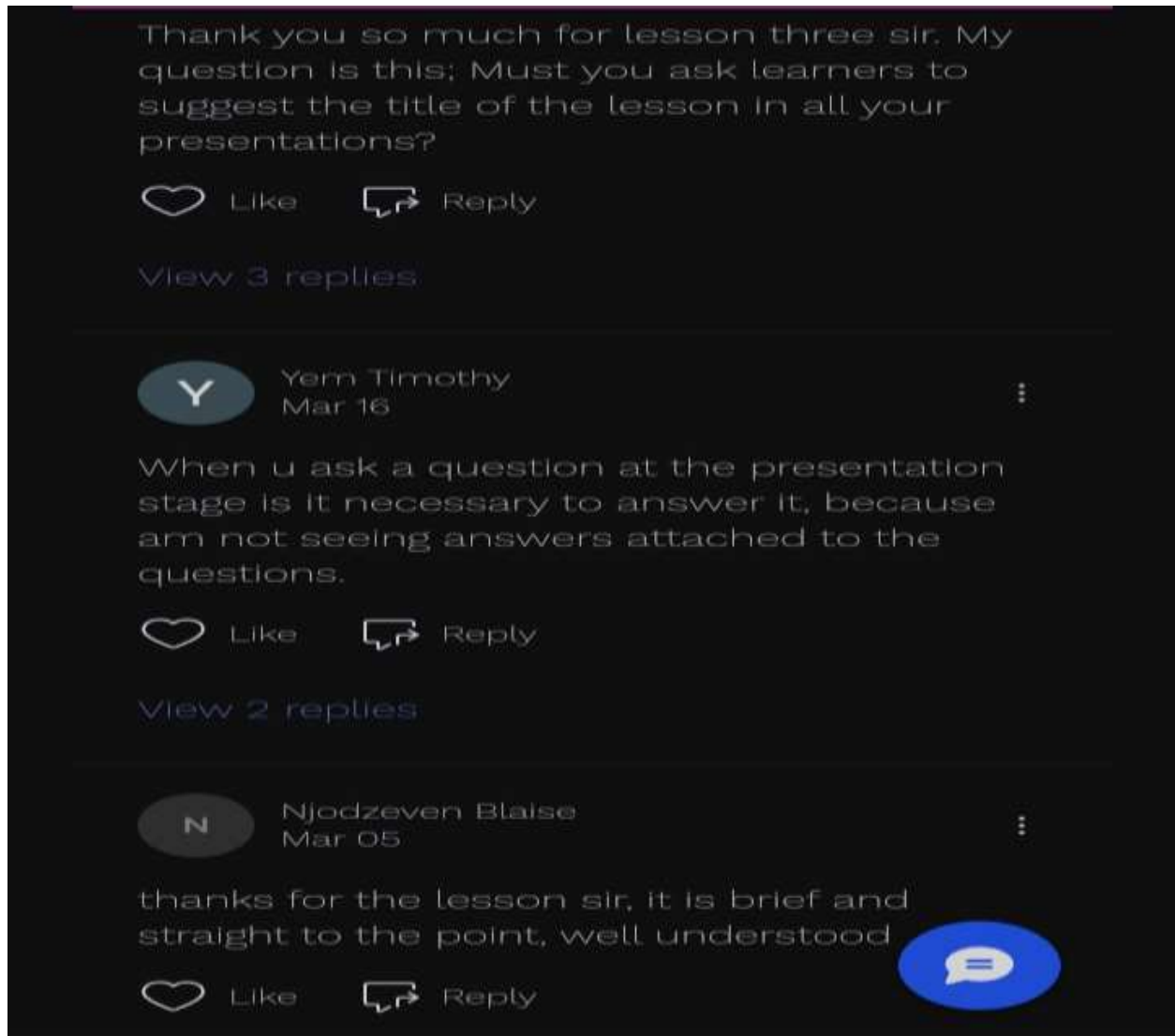
To roll out plan found on table 8 the participants were enrolled on an Interactive Mobile Technology (IMT) platform found on <https://imtpdimtpd2022.wixsite.com/mysite> developed for this study. The Home page of the platform is as seen on figure 38.

Figure 38: Screenshot of the welcome page of the IMT experimental platform developed for this study



The teachers interacted on the IMT learning platform on various topics indicated on the training module. Each participants had seven days to go through the lesson content of the week and react to it if necessary. They were expected to access the platform at their preferred day and time. A participant could access the content from various mobile technological devices as many times as possible. Some of the interactions of the participants during their learning on the IMT platform can be seen on the screenshot on figure 38.

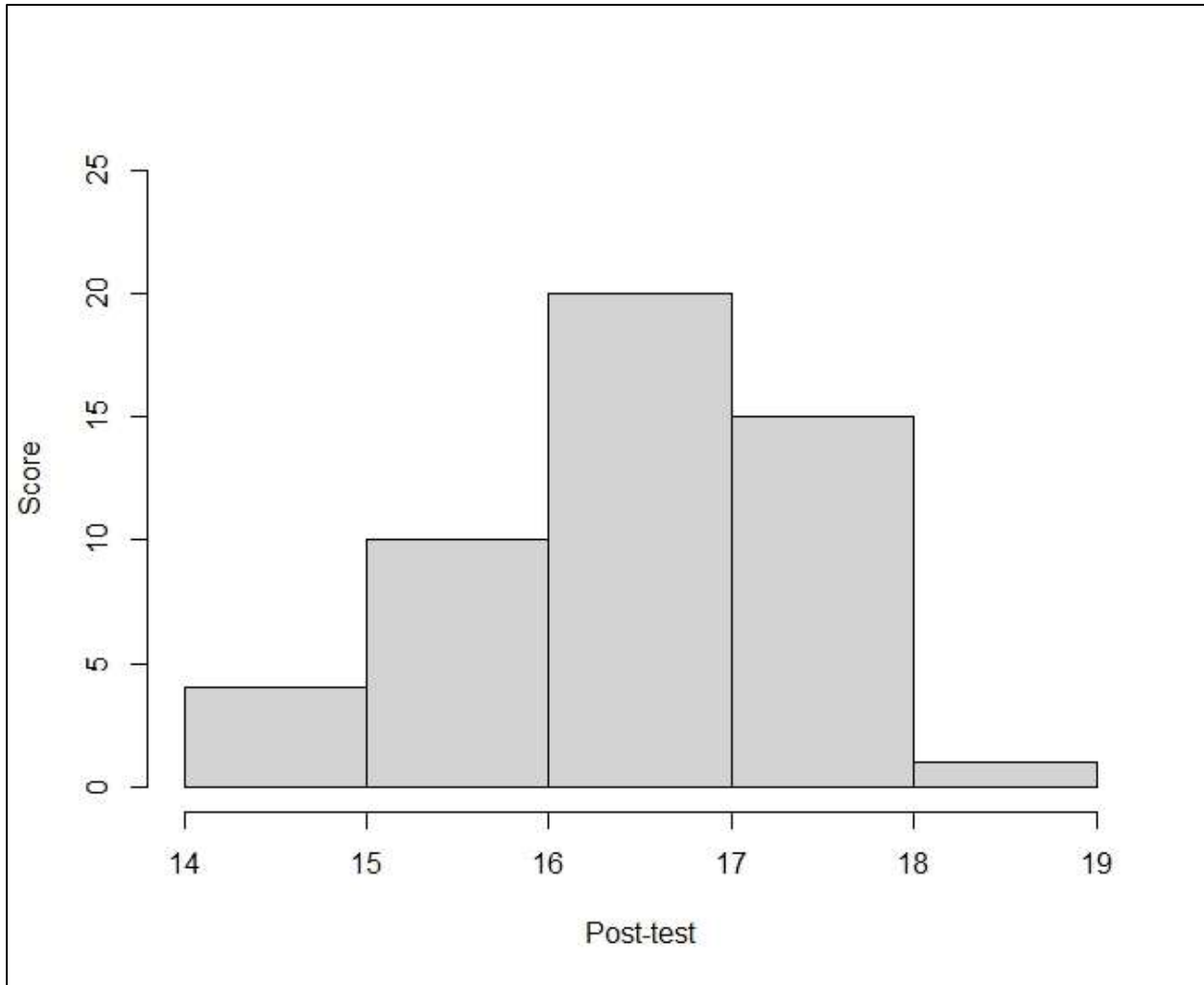
Figure 39: Screenshot of participants' interactions during the experimental phase



Informed by literature and findings of teachers' preference in the design consideration of TPD of research question two of this study, lesson content for the training sessions were presented on multiple formats (word, PDF, audio, video and power point).

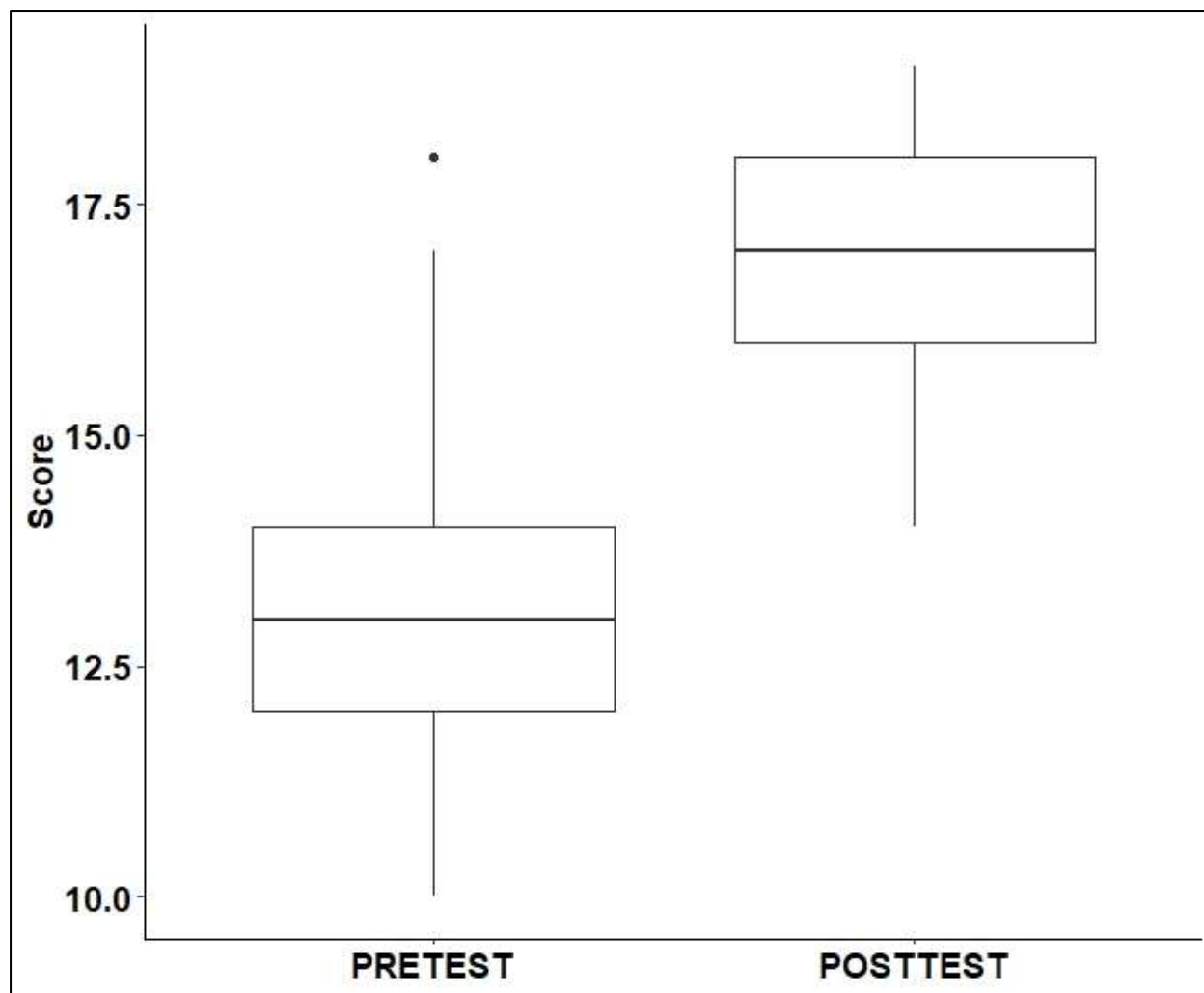
After six weeks of training, the teachers were administered a post test. The post test requested the participants to repeat the individual lesson plans they prepared at the level of the pretest. At the end of the exercise, the lesson plans were marked and the performance of the teachers were collected, analyzed and presented on figure 39.

Figure 40: Teachers' Performance During the Post Test



The histogram presented on figure 39 shows the distribution of the scores of the students during the post test. It can be noticed that most of the participants scored from 14 – 18 points on a scale of 20 and only a few scored above 18 points. A closer look reveals that the majority scored between 16 to 18.

Figure 41: Pretest Post Test Correlation



The boxplots presented on figure 41 shows the distribution of the scores of the pretest and the posttest side by side. It can be noticed that the scores of the pretest were way lower compared to those of the posttest. Thus, it can be concluded that the participants improved in their performance in the posttest compared to the pretest.

Table 9: Descriptive statistics of the mean Performance of Teachers during the IMT experiment

	N	Mean	Sd	Median	Min	Max	Paired T-test	95% Confidence interval
Pretest	50	13.02	1.73	13	10	18	D = 3.94	
Posttest	50	16.96	1.01	17	14	19	t = 17.891, df = 49, p-value = 0.000	-4.383 -3.497

The statistics presented on table 9 presents the descriptive statistics and the results of the paired T-test. Looking at the mean score, it will be seen that the mean score of the pretest was 13.02 and that of the posttest was 16.96. The difference in the scores was 3.94, that is, the posttest scores were 3.94 points higher than those of the pretest. The results of the paired T-test indicated that there was a statistically significant difference in the mean scores of the pretest and the posttest ($t = 17.891$, $df = 49$, $p\text{-value} = 0.000$).

Summary

In this chapter, data for the study was collected, analyzed and reported. The Mobile Model for Teacher Professional Development was developed and experimented. All the instruments for data collection were constructed by the researcher, trial tested to ensure that they were valid and reliable to effectively collect data for the different studies conducted.

The data collected for the study were both qualitative and quantitative in nature. To collect qualitative data the researcher made use of a set of questionnaire to collected data to answer research questions one, two and three, a set of test was used, wherein a pretest and a post test were administered to collect data to answer research question four. The researcher also collected qualitative data wherein open-ended questions were asked in order to get participants' views in a bid to further strengthen findings of research questions one, two and three.

The data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. The data was presented in frequency counts, percentages, mean and paired t-test. The analyzed data indicated that the one shot method of TPD had some weaknesses. The analyses further indicated that teachers prefer that they should be contacted when planning for TPD programs and that policies related to TPD should be very clear. At the end of the process, the

Mobile Model for Teacher Professional Development was experimented and it was realized that there was a statistically significant mean difference in score between the pretest and the post test.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND SUGGESTIONS

This study was aimed at finding out the efficacy of the mobile model of Teachers' Professional Development in enhancing nursery and primary school teachers' professional development in Cameroon. This chapter summarizes the main findings of the data collected, analyzed and presented in chapter four of this research project. After which discussions have been made. At the end of the chapter, implications of the Mobile Model for Teacher Professional Development were stated, then suggestions for further studies were also identified and presented.

Summary of Main Findings

The main aim of this project was to find out the efficacy of the mobile model in enhancing nursery and primary school teachers' professional development in Cameroon. To attain this objective, four research questions were formulated. In this section of this study, the summary of the main findings emerging from each of the four research questions analyzed in Chapter 4 are presented.

Research Question 1: What are the weaknesses underpinning the one-shot model of teacher professional development in nursery and primary schools in Cameroon?

The approach chosen to answer this research question was the administration of survey questionnaire containing five Likert Scale items and one open ended item to 384 teacher-participants selected using the stratified random sampling technique from the 10 Regions of Cameroon. The test items were designed to investigate the weaknesses of the one-shot model of teacher professional development. From the findings presented in Chapter 4 of this research project, it was established that the teacher-participants indicated that the one - shot model of TPD is weak in meeting their professional needs and aspirations as it is:

- Usually not connected to previous sessions
- Teachers' professional difficulties are usually not taken into consideration when choosing topics of discussions during seminars and workshops
- Teachers have to abandon their duty post to attend TPD programs making it difficult for them to cover the attributed workload

- Usually done through lectures with little hands-on activities which are done in a rush at the end of the session because of time constraints.
- The time attributed for TPD in the one-shot model is usually too short to meet the aspirations of the teachers.
- There are no concrete plan of activities at the start of the year, thus teachers are surprised at any moment in the course of the school year to move to seminar and workshop groups, without any form of mental preparation.
- Teachers only know the topic of discussion while at the training centre or few days to the training.
- There are usually no form of motivation for teachers who attend the one-shot model of Teacher Professional Development.

Research Question 2: What are teachers' Preferences in the Design of a Mobile Model to Enhance their Professional Development?

In order to answer this research question, the researcher administered survey questionnaire containing eleven Likert Scale items and one open ended item to 384 teacher-participants selected using the stratified random sampling technique from the 10 Regions of the Republic of Cameroon. The test items were designed to investigate teachers' preference in the designing a mobile model to enhance teachers' professional development. Looking at the findings presented in Chapter 4 of this study, it was concluded that the teacher-participants preferred a teacher professional development model which is open and multi-dimensional. Precisely, the teacher participants preferred a model in which:

- Content can be presented in many formats like video, text and audio
- Training is continuous and ongoing
- Interactions can take place between Senior pedagogues and less experienced colleagues
- Participants can express their professional difficulties to other pedagogues in search for a solution.
- Content for TPD can be broken down into comprehensible training modules for easy assimilation.

Research Question 3: What Policy Orientation Should Guide the Use of Mobile Learning in Enhancing Teachers' Professional Development?

In order to provide an answer to this research question, the researcher administered survey questionnaire containing nine Likert Scale items and one open ended item to 384 teacher-participants selected using the stratified random sampling technique from the 10 Regions of the Republic of Cameroon. The test items were designed to policy orientations which could guide the use of mobile learning to enhance teachers' professional development in Cameroon. A glimpse at the findings presented in Chapter 4 of this study, it was realized that the teacher-participants indicated that there should be a clear policy guiding Teacher Professional Development in Cameroon. The participants indicated that the policy should:

- Clearly state how teachers should be motivated when they take part in Teacher Professional Development Programs.
- Guiding principles should be set aside to monitor teachers who are highly engage in TPD programs.
- Clearly spell out time during which teachers will be engaged in Teacher Professional Development activities.
- Clearly spell out the place of ICT use in enhancing Teachers' Professional Development in Cameroon.
- Spell out that policies regarding the use of Mobile Learning in enhancing TPD should be constantly revised

Research Question 4: What is the performance of Nursery and Primary School Teachers after Participating in a Mobile Learning Program?

In order answer this research question, the researcher administered made use of a pretest and a posttest in which the fifty teacher participants were requested to prepare a complete lesson plan. The lesson plans were marked and their scores recorded. The teachers were then engaged in a mobile learning platform designed using the expressed preference of the teacher participants, where they training on lesson planning. At the end of the five weeks training session, they were asked to prepare lesson plans on the same lesson they did during the pretest. At the end of the post test, test scores were generated and correlated with the test scores gotten during the pretest.

At the end of the testing process, it was concluded that there is a statistically significant mean difference between the pretest scores and those of the posttest.

Discussion of Findings

This study galvanizes relevant theories and guidelines into practice to test the efficacy of the mobile model in enhancing teachers' professional development. This section discusses the findings summarized above in relation to the literature reviewed in Chapter two. The findings have been discussed in four broad sections which include weaknesses underpinning the one-shot model of Teacher Professional Development, teachers' preference in the design consideration of a mobile model for Teachers' professional Developments, Policy orientations to guide the use of mobile learning in Teachers' professional development and the performance of teachers after part taking in a professional development program through the use of mobile technology. These four broad sections are inline with the four research questions presented at the beginning of this research work in chapter one.

What are the weaknesses underpinning the one-shot Model of Teacher Professional Development?

A nation-wide survey was carried out to find out from the research participant the weaknesses that they face in the use of the one-shot model to enhance their professional development. The findings revealed that the one-shot model of TPD is insufficient in meeting their professional development aspirations. This finding is in congruence with other research works which have proven that the one-shot model of TPD is usually do not meet the professional development needs of teachers. Vividly, the one-shot model of TPD has been criticized for diffusing content that are not in actual accordance with the professional development needs of teachers. In complementing this requirement, researchers hold that models related to teacher education should produce interesting content tailored to the professional needs of teachers (Darling-Hammond & Richardson, 2009). Other researchers have argued that the topics chosen for seminars and workshops tend not to address the real problems teachers face in carrying out their teaching duties (Villegas-Reimers, 2003). It is even purported that Teacher Educators typically sit in their offices, select the content they are best at, and launch seminars and workshops without due consultation of the teachers on the field. The fact that this content does not meet the learning

needs of teachers makes it clear that the knowledge gained by teachers has little or no impact on their professional development and thus fails completely to motivate them and improve their teaching skills (McAleavy, Hall, Horrocks & Rigall, 2018). Thus, inappropriate contents renders the one-shot model of TPD weak. Concomitantly, the one-shot model of teacher development, as posited by Mwaruma (2013) and Sumey (2013) is said to lack follow-up and monitoring mechanisms that are essential elements of an effective teacher development model. According to other researchers, this situation falls short of the expectations of progressive models that promote teacher professional development and enable meaningful learning from teachers (Darling-Hammond & Richardson, 2009). One-off seminars typically do not assess the teacher's experience with the material discussed in previous sessions. So, there is usually a new topic to discuss in each session, which can disrupt her TPD process and even distort the professional development process of a teacher. Steiner (2014) argues that such seminars would have been more useful if the inspectors conducting the seminars could accompany the teachers in the classroom and investigate what difficulties the teachers had in applying what they learned in the workshops and seminars. Some teachers forget concepts learned during training upon returning from a seminar because there is no one to follow up to remind them of what is expected of them.

The participants of this study further indicated that some of the presenters during the one shot model of TPD do not master the content which is being delivered and as such, teachers leave the training session, confused with no clear explanation of the topics discussed during the training session. Some of the respondents purported that the organizers during the training sessions usually have conflicting views over the topic of discussion during seminars and workshops, a situation which leaves the participants more confused than they came in for the training. Furthermore, respondents felt that one-shot models for improving TPD were generally overly theoretical and lacked sufficient material to make discussion and training more concrete. These respondents felt that due to the large number of teachers attending seminars and workshops, sufficient speakers, microphones and projectors should be used to explain the concepts being discussed. However, in most cases the lack of these materials makes the training sessions very theoretical and makes it difficult for teachers to understand the concepts as the seminars and workshops are also sometimes centred on the facilitator which makes acquisition of the content difficult for the teachers who are have diverse learning styles. These are clear indicators that the one -shot model is traditional and hierarchical methods of professional development cannot be

good model for the twenty first century professional development paradigm (Burns, 2018). The workshop practices are designed to suggest that the information lies with an all-knowing facilitator whose job it is to dish out knowledge to "less knowledgeable" professional teachers. Even if the facilitator is an expert in the topic covered, they may not have extensive experience teaching or teaching in the same context as the workshop facilitator. Prior to a workshop, facilitators often have little or no knowledge of the teachers they are to encounter during the seminars, making it difficult and at times impossible for trainers to gain insight into the participants' professional challenges and goals. Moreover, one-two-shot her model does not appreciate cultural and regional differences, as the presenter always presents content based on her own experiences and perceived local realities. These features researchers say fall short of the guidance professional teachers so much desire Imam (2022), the researcher believes that TPD programs should provide ongoing support and feedback through activities such as team teaching, joint evaluation of plans, targeted peer observation, and support from teachers and trainers. Another researcher also argues that it is important to consider teachers' developmental levels and needs, and that feedback and support should be based on teachers' needs (Christine Coombe, 2020). Teachers with the same weaknesses can plan and teach together to improve different aspects of teaching (Richards & Farrell, 2005). As Fullan (2001) points out, peers are most effective when teachers need help. In other words, learning requires interaction and cooperation between teachers, teachers, and trainers (Nguyen, 2019) and is not unilateral training based on the perceptions of teacher-trainers. Edge (2002) argues that joint development is a necessary part of TPD. Imam (2022) further points out that professional teachers must be given the opportunity to critically and systematically reflect on their practice while also cultivating new perspectives. In this case, teachers need to practice, reflect and evaluate what they have taught in the classroom. In this case, a robust system should be put in place to monitor the process. Involving teachers in the process changes their role from receiving input to being active participants who can make decisions and act independently. Teacher engagement increases retention (Abbaszadeh, 2021), and engaged teachers improve teaching and have a positive impact on learner engagement (Cardwell, 2011). Teachers as educators (Knezevic & Scholl, 2002) need time to expand their knowledge and skills (Richards & Farrell, 2005). This process must therefore be continuous and sustainable.

In addition, majority of respondents indicated that participants in seminars and workshops are usually not motivated. To them, this represents a significant weakness of the one-shot model for improving teacher professional development. In the Cameroonian context, the participants intimate that teachers at times are instead expected to donate money to motivate training organizers rather than to motivate them financially. They view this as a weakness because they believe that it is the state's duty to pay money to the organizers of TPD training if they are willing to conduct the exercises. This falls short of the work of Kennedy (2017) who believes that undermining motivational factors in TPD is tantamount to neglecting efforts at enhancing Teachers' Professional development. The OECD (2018) opines that teachers should be motivated to attend the TPD programs, whereby it is stipulated that motivation could be in the form of recognitions, promotions, certification and even financial. On the contrary findings of this study revealed that in the one-shot model of TPD, the teachers are instead expected to pay for the exercises a situation which can be a demotivating factor to them. They also expressed the position that teachers are expected to purchase practical materials such as presentations and manuals as part of a one-off model to improve TPD in Cameroon. Respondents indicated that teachers may not be able to afford such documents, making training ineffective. In addition, teachers believe that money should be provided for children's transportation and meals. However, in most cases, teachers are required to cover travel expenses and self-support expenses to the training venue. For them, this is why teachers who cannot afford to pay for transportation are absent during TPD training sessions because they do not participate in the exercises. Apart from financial benefits, respondents also believe that other forms of incentives, such as certificates of attendance, are given to seminar and workshop participants as strong incentives for teachers to participate in professional development programs. Therefore, according to participants, motivations should range from financial incentives to entitlements and other forms of motivation. Thus, the respondents are of the view point that the absence of financial incentives and other forms of motivation given to teachers to encourage their attendance and pay for other costs of the one- shot model of Teacher Professional Development constitutes a serious weakness of the model.

Furthermore, participants of the study expressed the view point that the content of seminars and workshops constitute another weakness of the one -shot model to enhance teachers' professional development. This is because the content of the one -shot model to enhance Teachers'

Professional Development is usually irrelevant to some of the teachers and do not meet their professional needs, a situation which according to them is due to inadequate needs analysis done by the organizers of the training. These situations represent the weakness of the one-off model for improving teacher professional development, which in inline with other research works as Steiner (2014) believes that the one-off seminar model for teacher professional education is not only fragmented, disjointed, and inconsistent, it also fails to meet the professional development needs of teachers. Still in congruent with this research finding, the National Commission on Mathematics and Science Education in the 21st Century (2000) postulates that any good TPD model cannot succeed without strong content that deepens teachers' pedagogic and content knowledge of important topics, sharpens their teaching skills in the classroom, enhances their ability to keep up with subject developments, enhances their ability to monitor students, and brings knowledge to the broader educational community, a situation which stand sharply in contra to the findings of this study. In line with the findings of this study, researchers have postulated that relevant teacher professional development models should produce interesting content geared towards the professional needs of teachers (Darling-Hammond & Richardson, 2009). As indicated by the research participants, other researchers have argued that the topics chosen for seminars and workshops tend not to address the real problems teachers face in carrying out their teaching duties (Villegas & Reimers, 2003). Educators typically sit in their offices, select the content they are best at, and launch seminars and workshops. The fact that this content does not meet the learning needs of teachers makes it clear that the knowledge gained by teachers has a very little impact on their professional development and thus fails completely to motivate them and improve their teaching skills (McAleavy, Hall, Horrocks & Rigall, 2018).

What are teachers' preferences in the design of a teacher professional development model through the use of mobile learning?

This research question was aimed at finding out the preference of teachers on the measures to be taken into consideration when designing a model to enhance their professional development with the use of mobile technology. To answer this research question, a nation-wide survey was conducted amongst 378 teacher participants of the basic education sub sector who responded to both closed ended and open-ended questionnaire items. The data collected analyzed and presented shows that teachers prefer that in designing a model for TPD, the model should be that

which encourages content to be presented in multiple formats like video, audio and text. This finding is in congruence with the research work of some researchers who advocate that the format in which the contents are presented is of great significance to the teachers for instance Brodesky, Fagan, Tobey, and Hirsch (2016) are of the opinion that the content of Teacher Professional Development should be based on the choice and preference of the teachers. Further supporting this finding of this study, other researchers like Kowalski, Busey, Bates and Beilstein, (2017) have intimated that based research findings, the content of Teacher Professional Development could be presented in multiple formats like text, audio, picture and video formats. These scholars further posit that in choosing the format teachers should be allowed to express their view points as far as the format of the content is concerned. This is done based on the fact that some teachers might prefer text while others will prefer videos and images and another set of teachers might equally a blend of text, images and videos. Thus, to resolve such dilemma, this research finding holds that the content of Teacher Professional Development should be presented in multiple format in order to meet the needs of the teachers who are diversified in their attributes. However, researchers hold that the use of videos in the professional development of teachers have been said to have great effects on the learning process of teachers (Seidel, Sturmer, Bloomberg, Kobarg & Scwindt, 2011). The format of the texts and the video should also be taken into consideration because not all mobile technological tool like smart phones, and Ipads used by the teachers can access the different formats of content. For example, in presenting content in the form of text, the designer needs to be sure if the mobile gadgets of the teachers can access the text the form of PDF form or MS Word. This should be particularly taken into consideration when designing tools like webinars which incorporates video and sounds in carrying out training activities. This can make use of a method of TPD which the World Bank (2022) refers to as Educational Digital Resources.

The findings also revealed that teachers prefer Teacher professional development model which encourages collaboration amongst colleagues. This is the case as the teachers expressed preference for a TPD in which they learn with a group of colleagues to share best practices. This research finding is in congruent with the works of other researchers Davis (2020) who posits that teacher collaboration occurs when members of a learning community decide to work together in order to improve on their professional practice as a strategy of improving on students' learning. The researcher goes ahead to indicate that when teachers come together with the aim of sharing

information about professional development which will be used in enhancing their Professional Development, professional learning becomes more accessible and effective. Other researchers have further insisted that Teacher Professional Development does not take place in isolation. Darling-Hammond and Bransford (2005), Shulman and Shulman (2004) and Hagg (1996) all stand for the idea that current professional development favours the creation of learning communities in which participants collaborate with peers on meaningful activities and co-construct knowledge about teaching. In congruence to this idea, the World Bank (2022) holds that such collaborations can take place in a community of practice where teachers meet and reflect together to improve teaching (Ralaingita, 2021). Similarly, several studies have shown that constant connections in a group of professionals over their professional development is essential in bringing about an improvement in professional praxis (Clement & Vandenberghe, 2001; Shah, 2012; van Veen et al, 2012).

In the same vein, the findings also revealed that teachers prefer a Professional Development Model in which it will be possible for more experienced colleagues to guide less experienced teachers. This research finding is in accordance with other research work of Berry (2019) who purported that teachers have expressed the need to be guided by more experienced teachers in the course of their professional development. This finding is also in accordance with the socio-constructivist theory which propounds that in the learning pursuit, the learner is always found in a zone of proximal development, which is a transition stage between what the learner can do and what he/she cannot do and therefore need the help of a More Knowledgeable Other (MKO) to move him/her out of the ZPD. The MKO in the case of this finding is the more experienced teacher who has to guide the less experienced teacher out of the ZPD which is a zone of more experienced and shed light into their professional difficulties. This finding is also inline with the work of the World Bank (2022) who propounds that the through the Modeling of Best Practices, more experienced teachers can show less experienced teachers the professional competences that are expected of them. The World Bank (2022) further instigate that in using Modeling of Best Practices (MBPs) various technologies can be used in the process, since it is sometimes difficult to assemble all the teachers in a face-to-face session. These technologies can span from videos, audios to text. Therefore, in designing a model to enhance teachers' professional development, teachers prefer that the model should be designed in such a way that more experienced teachers will guide the less experienced colleagues in the pursuit of better teaching output.

In addition, teachers expressed the view point that in developing a model to enhance TPD, the model should be developed in such a way that it integrates both remote and face-to-face activities. This research finding is in accordance with the stipulations of McAleavy, Hall, Horrocks and Riggall (2018) who opine that the sole use of technologies in enhancing TPD is not ideal as there is always a need for some face to face training with the participants. To further elucidate this finding, Burns (2013) carried out a study in Indonesia comparing blended learning and online learning. The findings of Burns' study revealed that students involved in blended learning performed better than those who were involved in online studies, as the completion rate of learners involved in online learning was low, compared to those who were involved in blended learning. Burns and Lawrie (2015) further support this research finding by suggesting that blended learning mode best fits in situations of low and fragile financial means like the case of Cameroon.

Finally, the findings of this study further revealed that in designing a model to enhance TPD, the model should make it possible for training to be continuous and ongoing. This research finding is inline with the research works of Guskey, (2000), Supovic and Tuner (2000) who think that to have a meaningful teacher professional development program, the participants should be involved in Teacher Professional Development activities for between 60-80 hours for every school year. This postulation is further supported by Burns (2018) who hold the view point that teacher professional development is a continuous process that goes on for a considerable period of time and can be considered as a process and not an event. Concomitantly, Hagg (1996) on the other hand holds that teachers need sufficient time to learn the content of TPD, understand it, practice it and interact with colleagues in order to share ideas and beliefs as far as the content is concerned. Hagg (1996) further thinks that such an important activity cannot fit into a school day because it will call for persistent interruption of lessons.

Which Policy Orientations Could Foster the Smooth Implementation of Mobile Learning in Nursery and Primary schools in Cameroon?

This research question was aimed at finding out policy orientations that could facilitate the integration of mobile learning in the teacher professional development within the basic education sub sector. To answer this research question, a set of eight item closed ended and one item open ended questionnaire was administered to the 378 participants of this study. The data collected

from the participants were analyzed using both descriptive and inferential statistics. The finding revealed that the state should first of all formulate a clear policy guiding Teachers' Professional Development in Cameroon and then formulate another clear policy guiding the use of mobile technology in enhancing Teachers' Professional Development in Cameroon. This research finding is in accordance with the research work of Anwar (2017) who posits that each state should formulate a clear policy to guide the TPD process. Similarly, Wang, (2007) is of the opinion that, teacher professional development policies should be promulgated and led by government bodies as a way for the state to ensure that teachers adhere to established pedagogic demands as a means of effectively rolling out the curriculum. Husby (2005) on the other hand contradicts this belief by arguing that excessive state control without adequate consultation of the teachers who are the real actor in the field could render teacher professional learning irrelevant. To support the idea of Husby (2005), Hargreaves (2006) and Goodson and Hargreaves (2003) opine that top down policies on TPD issues without consultation of the teachers themselves will help teachers not to yield to the demands of change. It due to excessive state control and centralization of policies that the implementation of Teacher Professional Development programs is usually faced with Political, economic and social dilemmas (Blase, 2005). Therefor Anwar (2017) postulates that all teachers are professionals who can reflect, critique and develop ideas and so should be engaged in the policy formulation process.

As far as the finding which concerns a clear policy in the use of mobile technology in enhancing teacher's professional development the research finding is in rapport with the work of UNESCO (2011) who advocate that the state has to formulate a clear policy of the use of mobile technology in enhancing teachers' professional development. To do this, the state should appropriately train teachers in the use of technologies, create and optimize educational content for the use of mobile technologies, ensure gender equality amongst teacher for the use of mobile technology, expand and improve connectivity infrastructures, develop strategies to provide equal access to all, promote safe, responsible and healthy use of technologies and finally the state should raise awareness of the use of mobile learning through advocacy, leadership and dialogue.

It was further revealed that teachers should be motivated to attend TPD sessions. This finding is in line with the postulations of Kennedy (2016) who advocates that motivation of teachers in engaging in Teacher Professional Development programs is of utmost importance in the success

of any TPD program. The researcher continues to posit that even though the motivation of teachers in engaging in TPD exercises has been treated with a lot of triviality if there is actually a desire to succeed in the TPD efforts, both the extrinsic and intrinsic factors that motivate teachers to undertake Professional Development Programs should be identified and addressed. Extrinsically motivated behaviour is usually understood to refer to activities that teachers engage in for very important reasons, which is due to their association with a desired outcome. In line with this, the OECD (2015) holds that extrinsic motivations like promotions, recognitions and certifications can be given to encourage teachers to keep on attending TPD programs. Intrinsically motivated behaviour, on the other hand, is autonomous and driven solely or primarily by the teacher's interest for enjoyment of a given activity. Although activities that are usually not interesting or enjoyable generally need some extrinsic motivation, in reality, different forms of behaviour are provoked by a combination of both intrinsic and extrinsic motivation. EDU/WKP (2020) on the other hand, holds that to stimulate teachers' intrinsic motivation to engage in TPD programs should not only be in formalised TPD programs but also in private and self-initiated autonomous practices initiated by teachers to improve their professional development. Moreover, Cordingley et al. (2015) on their part hold that they can be successful whether they are voluntary or obliged by administration, and that the most important factor is whether the activities teachers are engaged in can maintain and instill a shared sense of purpose among teachers participating in the program. Therefore, to succeed the Teacher Professional Development dream, there is need to formulate clear policies that will clearly indicate how teachers will be motivated to engage and stay on the TPD process.

Similarly, the findings of this study uncovered that the state should clearly define in the policy of TPD how financial resources are gotten and utilized in the TPD process. This finding is in accordance with the research works of OECD (2019) who purports that a great proportion of teachers have describe issues of funding as being a great hindrance to their professional development struggle, so states and institutions must derive clear statements on how TPD exercises are funded at different levels. This is because the OECD (2014) opines that the mechanisms that schools and educational systems use to fund teachers' professional development activities vary considerably, thereby stating that in some countries, for instance, funding for teachers' professional development is included in staff expenditure block grants with a high level of spending control at the local level. Teachers in some systems without earmarked TPD funding

have reported difficulties in accessing necessary resources for their professional development (OECD, 2017), therefore highlighting the need for a specific and clear policy on issues related to TPD funding. In formulating such a policy, the OECD (2018) indicates that policy makers need to be mindful of the potential inequalities that can arise at both the national and the school level, as well as possible unintended consequences that funding conditions may cause on teachers' PD engagement. In this light the policy should not be a one size fit all model as local realities must be taken into consideration in the policy formulation.

Furthermore, the findings of this study uncovered that in formulating a policy to enhance teacher professional development, the state should clearly spell out time to permit teachers undertake professional development activities. This finding in congruence with the work of Guskey (2000) and Supovic and Tuner (2000) who postulate that TPD activities must run for between 60-80 hours per academic year and thus, the state must clearly define in a policy how the over 60 hours per year is to be distributed over the eight pedagogic months of the school year. In the same light, Hagg (1996) on his part holds that teachers need sufficient time to learn the content of TPD, understand it, practice it and interact with colleagues in order to share ideas and beliefs as far as the content is concerned and such a time must be clearly spelt out by the decision makers and at the same time, permitting the teachers to complete the work enshrined in school syllabuses. Hagg moves on to posit that such an important activity cannot fit into a school day because it will call for a persistent interruption of lessons, which will make it combat some for educators to complete their annual workloads allocated in school syllabuses. UNESCO (2011) and the OECD (2019) both hold that the allocated time should be within the teaching weeks of the school year and if by some measures, the state decides to organize TPD exercises out of the working days or weeks of the teachers, a mechanism of compensation and motivation should be elaborated and made known to the teachers. In such a way, the teachers will be motivated to take part in the Teacher Professional Development exercises organized out of their predefined work schedule. All these should be spelt out in a policy to enhance TPD.

Finding the studies revealed that policies regarding the use of Mobile Learning to enhance TPD should be revised constantly. This research finding is in accordance with the findings of UNESCO (2011) which holds that existing policies related to mobile learning should be updated due to the fact that the world of education is constantly changing and so too the policies that guide its implementation should constantly be modified to suit the most recent contexts. In this context,

policies on the use of technologies in enhancing teacher professional development which are valid in the society of today might not be very valid in guiding the implementation of TPD with the use of technologies and thus, the policies guiding the use of technologies in enhancing TPD should be revised regularly to be abreast with the most recent research findings and with technological evolutions.

What are Nursery and Primary School Teachers' Performances after Pursuing a Professional Development Program through Mobile Learning?

This research question was aimed at finding the performance of nursery and primary school teachers after being engaged in a TPD program with the use of mobile learning. To answer this research question, fifty (50) participants were engaged in a pre-test to find out their prior performance after which the respondents went through a series of PD training with the use of mobile learning. At the end of the study a post test was administered to the same group of participants and the results of the pretest was correlated with that of the post test and the findings revealed that there is a statistically significant difference between the pretest and the posttest, showing that TPD through mobile learning is capable of improving the professional performance of teachers. This finding is in line with the stipulations of Burden (2009) who thinks that the use of technologies in enhancing Teachers' professional development is more effective than any other channel of delivering the contents of TPD. Burns makes such postulations on the grounds that the use of technologies in the TPD process enable teachers to gain access to current information on pedagogical evolutions as well as technologies help teachers to communicate and collaborate with other teachers irrespective of their geographical location.

Conclusion

The purpose of this study was to find out the efficacy of the mobile model of teachers professional development in enhancing teachers' professional development in nursery and primary schools in Cameroon. The research findings revealed that the one-shot model of teachers' professional development used in Cameroon is not strong enough to meet the professional development needs of nursery and primary school teachers in Cameroon. This is because the one-shot model runs for a very short duration to meet the desired objectives of TPD,

is fragmented, does not take teachers' professional needs into consideration and its methods of presentation is too theoretically and at times ushers some confusion in the minds of teachers.

As a consequence, the use of the mobile model of TPD model which enhances cooperation, is continuous, ongoing and takes the professional development needs of the teachers into consideration is much desired as expressed by the teachers in the nation-wide survey to find out their preferences in the design consideration of their TPD programs.

The data collected and analyzed from a group of 50 participants who took part in a teacher professional development training using the Interactive Mobile Technology (ITM) Model indicated that there was a statistically significant improvement in their performance, indicating the the mobile model of teacher professional development is effective in enhancing the professional development of nursery and primary school teachers in Cameroon. From this, it was recommended that the state should formulate a clear policy guiding the introduction of mobile learning into TPD practices in Cameroon, teacher educators should integrate mobile learning into their TPD practices in Cameroon so that TPD in Cameroon nursery and primary schools can be continuous and ongoing, worthy of meeting the professional development needs of its teachers which will bring about better performance of teachers in the instructional process and thus improve the acquisition of knowledge by nursery and primary school pupils.

Recommendations

From the discussion of the major findings and the conclusions drawn, the following suggestions were made:

Reecommended Model of Teachers' Professional Development

The findings of this study revealed that the one-shot model to enhance teacher professional development too weak to meet up with the PD expectations of teachers in recent times. This is because it is amongst others, fragmented, lacks follow up and it alienates the teacher is the planning phase. The findings of this study have clearly demonstrated that the Interactive Mobile Technology Model of TPD is a highly effective model of enhancing TPD. Therefore, teacher educators should use the Interactive Mobile Technology Model of TPD in enhancing the PD process of teachers.

Recommendations to Teacher Educators

Teachers in a nation-wide survey as presented in this study expressed the need to be contacted when planning for Teacher Professional Development activities so that their actual professional

needs and aspirations should be taken into consideration. In this light, Galaczi, Nye, Poulter and Allen (2018) intimate that the professional needs and aspirations of teachers must be identified and placed at the centre when planning for Teacher Professional Development activities so that the content and methods should meet the common characteristics of the participants as propounded by Wenger, McDermont and Snyder (2002). Thus, teacher educators are called upon to derieve a communication link through which they can plan TPD activities with the teachers who are the primary consumers of the plan.

Teacher trainers are also called upon to begin effective training on the use of technologies in teacher training colleges so that when the teachers will finally graduate into the teaching field, they will face little or no hindrance in using technology in enhancing their professional development. This is because though ICT and didactics of educational Technologies are taught as subjects in teacher training colleges in Cameroon, the method of delivering the lesson contents more often than not theoretical which handicaps the prospective teachers in the practical utilization of technologies in the educational process. Therefore, teacher trainers are expected to render these subjects more practical as it will also be instrumental in helping prospective teachers handle and use technological tools in teaching in their prospective classrooms and in enhancing their professional development in the field of education.

In addition, teacher educators are also called upon to enhance cooperation and collaboration during TPD activities. This is so as during the nation-wide survey, teachers of Cameroon Basic education sub sector expressed the desire to work in in synergy with teachers in other schools, other sub division and other regions of the country in order to enrich themselves professionally and broaden their respective scopes of what obtains in other areas out of their own geographical area of practice. Such desires expressed by Cameroon Basic Education Teachers is backed by many scientific findings as seen in the research findings of Darling-Hammond and Bransford (2005), Shulman and Shulman (2004) and Hagg (1996). Though the present model of TPD enhances cooperation as during seminars, teachers are at times placed in groups to attain a specified objective, the cooperation is usually limited to a couple of minutes per school term (which approximately three months) per year. So, teachers in Cameroon basic education sub sector are prefer a cooperation which is continuous and ongoing. As a consequence, teacher educators should use technology as a measure of fostering such expressed desired cooperation.

Recommendations to Policy Makers

in 2015, the United Nations launched the 2030 strategic vision for sustainable development, which took the form of the Sustainable Development Goals (SDGs), (United Nations, 2018). Cameroon is a signatory to this vision whose goal 4 calls for an improvement in the quality of education. The call for quality education by the UN is further compounded by the effort of Cameroon to attain emergence by 2035. The Cameroon vision 2035 in section II.2 expresses the desire of having “well trained youths exalting merits and country’s expertise”. Having well trained youth, who are experts in their fields, can only be achieved through quality training with the availability of quality teachers who are at the forefront in bringing about the much-desired better quality of education. To stand up to this societal demand, the teacher need to be skillful and up to date in executing their teaching function. To do this, teachers need to be constantly receiving training to upskill them in the most recent pedagogic and content practices brought about as a result of innovations in the field of education. In this light, Teacher professional Development is the main strategies to accomplish this mission. However, the one-shot model of TPD used in Cameroon allows teachers mot of the times to take part in an eight hours per day workshop. This model has been criticized for being too short to meet the desired PD outcomes as an effective teacher professional development program is a process which is continuous and ongoing over a long period of time (Guskey, 2000; Supovic & Tuner, 2000; Burns 2018; Koellner & Greenblatt, 2018) and This research work has proven that technology is the way out in providing the needed most desired quality and long duration of between 60-80 hours Teacher Professional Development per school year as propounded by Guskey (2000) and Supovic and Tuner (2000). Policy makers therefore have as duty to put in place the policy recommendations presented in the research findings of research question three of this study in order to achieve the goals outlined in SDG 4 and the desired objectives outlined in section II.2 of the Cameroon Vision 2035 strategic document.

Suggestions for Further Studies

Future research should extend this study to investigate the process of pre-service teacher training in ICT so as to make possible recommendations. Such a suggestion is based on the fact that if during pre-service training, prospective teachers are not adequately taught ICT and educational technologies, it will hamper their future utilization of educational technologies in their professional Development when they become teacher professionals.

This research should also be extended to find out Teacher Educators' level of acceptance and use of educational technologies. This proposal is done on the grounds that if teacher educators are not well grounded in the acceptance and use of educational technologies in the execution of their duties, they might stand as a stumbling block to the integration process of educational technologies in the professional development of teachers.

This study focuses on the integration of technologies in the professional development practices of teachers. The study can be equally extended find out measures of widening access to technologies in rural areas. This is in a bid to reduce the technological gap that exists between various geographical locations within the country. Relevant suggestions in this area will enable policy makers and teacher educators to work in a bid of meeting the professional development needs of teachers in all geographical areas within Cameroon.

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APPENDIX I

QUESTIONNAIRE

Dear Respondent,

My name is Kenne L. Bellmon, a PhD researching student of the Department of Curriculum and Evaluation in the faculty of education of the University of Yaoundé I. I am presently carrying out a study on **The Mobile Model of Teachers’ Professional Development and its Efficacy in Enhancing Nursery and Primary School Teachers’ Professional Development in Cameroon.**

I thus, solicit your participation in the study. I assure you that the information you provide here shall be used strictly for academic purposes.

Section A: Demographic Information

Please place a tick (√) in any of the boxes below that best suits your response

1. Gender: Male Female
2. Please indicate your Region_____
3. Type of school; public lay private mission
4. Have you passed through a teacher training college? Yes No
5. Years of experience in the field of Teaching: less than five above five
6. Location of your school: Urban semi-urban Rural
7. Age range: 20-29 30-39 40-49 49-59 60+

SA: Strongly Agree, **A:** Agree, **N:** Neutral **D:** Disagree, **SD:** Strongly Disagree

I	Weaknesses of the one - shot Model of Teacher Professional Development					
SN	Statement	Options				
		SA	A	N	D	SD
1	The use of seminars and workshops to enhance teacher in service training is usually not connected to previous sessions					
3	Teachers’ difficulties are usually not taken into consideration when choosing the topics for seminars and workshops					
4	Presentations during workshops and seminars are usually done through lectures					

5	The time scheduled for seminars and workshops are usually too short to meet the professional development needs of the teachers					
6	Interrupting lessons to attend seminars, makes it difficult for teachers to complete their schemes of work					
7	Are there other weaknesses in using seminars and workshops to ensure the teachers' professional development? If yes, please write them in the space provided					
II	Teacher' Preference in the Design of a Mobile Model to enhance their professional development					
a	Teachers' community					
a		SA	A	N	D	SD
1	In designing a mobile Model for teachers' professional development, I prefer that my needs and aspirations be taken into consideration.					
2	I wish to be contacted before selecting the topic of discussion during professional development programs.					
3	In carrying out Teachers' professional development, I wish that the content should be broken down into sub topics for easy comprehension					
b	More Knowledgeable Other (MKO)					
4	During professional development, I prefer a more knowledgeable colleague to assist me					
5	I prefer teachers' professional development models in which I learn with a group of colleagues					
6	I prefer that teachers' professional development should be conducted in a face-to-face mode and remotely					
7	I prefer that teacher in service training programs should be a continuous process					
c	Perceived Ease of Use (PEU) and Perceived Usefulness (PU)					
8	I prefer teacher Teachers' professional development content to be presented in PDF format					

9	I prefer teacher professional development content to be presented in video format					
10	I prefer teacher professional development content to be presented in audio format					
11	I prefer teacher professional development content to be presented in Microsoft word format					
12	In this space, please add other ideas which you like to be taken into consideration when designing teachers' professional development package:					
II	Policy Orientation In the Design of a Mobile Model in Enhancing Teachers' professional development					
	Statement	SA	A	N	D	SD
1	The state should formulate a clear policy guiding Teachers' professional development					
2	There should be a clear policy regarding the use of ICTs in enhancing Teachers' professional development					
3	Teachers should be motivated when they attend Teachers' professional development					
4	Financial resources should be set aside to fund Teachers' professional development					
5	Guiding principles should be established to monitor teachers who are highly involved in Teachers' professional development					
6	Teachers who attain great heights in teacher in Teachers' professional development programs should be rewarded with appointment into a position of responsibility					
7	The state should clearly spell out time to permit teachers undertake Professional Development activities					
8	In this space, please write down other policies you think the government should make as far as teachers' professional development is concerned					

Thank you for your participation

Appendix II

Needs Analysis to conduct the IMT Model Experiment

Dear Participant,

Before you are engaged in the experimentation phase of this study titled **The Mobile Model of Teachers' Professional Development and its Efficacy in Enhancing Nursery and Primary School Teachers' Professional Development in Cameroon**, you are expected to respond to these questionnaire items as objectively as possible by marking an (X) in the box that best suits your response

S/N	STATEMENT	AGREE	STRONGLY AGREE	NEUTRAL	STRONGLY DISAGREE	DISAGREE
1	I will like to be trained on how to write the preamble of an individual lesson plan?					
2	I will like to have training on writing of instructional Objectives					
3	I will like to be trained on the stages of lesson planning					
4	I wish to trained on evaluation stage of an individual lesson plan					
5	I will like to be trained on instructional methods					

Thanks for your participation

Appendix III

Record of Teachers' Performance in the Pretest and Post Test

PARTICIPANTS' CODES	PRETEST SCORE/20	POST TEST SCORE/20
1.	12	17
2.	15	17
3.	11	16
4.	15	18
5.	16	18
6.	12	17
7.	14	18
8.	12	18
9.	13	17
10.	11	17
11.	10	16
12.	14	15
13.	11	16
14.	15	18
15.	13	14
16.	12	15
17.	12	16
18.	13	17
19.	14	18
20.	13	16
21.	14	18
22.	15	18
23.	13	17
24.	14	17
25.	15	18
26.	11	18
27.	10	17
28.	11	17
29.	13	16
30.	12	15
31.	14	16
32.	12	17
33.	13	17
34.	14	18
35.	15	18
36.	11	17
37.	17	18
38.	12	16
39.	18	19
40.	13	16

41.	14	17
42.	15	18
43.	13	17
44.	11	17
45.	12	16
46.	12	17
47.	13	17
48.	12	17
49.	13	17
50.	`11	18

APPENDIX IV

EXTRACT OF THE THEMATIC CONTENT ANALYSIS QUALITATIVE ANALYSIS

OBJECTIVE ONE

SN	Theme2	Count of Theme2
1	Frequent training	30
2	Provide allowance	20
3	Needs analysis	18
4	Didactic material	15
5	Certification	10
6	Timing	10
7	Ensure attendance	10
8	Recruitment	9
9	Salaries	7
10	Good planning	7
11	Award to teachers	6
12	Reality	6
13	Follow up	5
14	Trained facilitators	5
15	Inclusive education	4
16	system automation	3
17	Allocate budget	3
18	Teacher recycling	3
19	Rotatory design	3
20	ICT trainings	3
21	Cost free	3
22	Leave motivation	3
23	Improve teaching	2

	conditions	
24	Strengthen bilingualism	2
25	Justice	2
26	Multiple platforms	1
27	Relevance	1
28	Online	1
29	Respect teachers	1
30	Distance learning	1
31	Revise educational system	1
32	Diversity	1
33	Closing ceremony	1
34	Value teaching	1
35	Workshop sessions	1
36	coffee breaks	1
37	Location	1
	(blank)	

Grand Total	201
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Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided		Grounding (frequency)
Theme		
Irrelevant themes		999 118
	9ui	
	Creas more schools	
	In-service	
	It helps to enhance teachers who are new in the field	
	Le changement des méthodes	
	Le niveau intellectuel de certains enseignants bas	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	Manque des moyens financiers.	
	Multiplier les sessions de formation	
	N/A	
	No	
	No. I do not see any weakness. Seminars and workshops are actually good for me.	
	Oui	
	Oui il faut continue	
	Oui ,il faux continue	
	Plate for me en ligne	
	Recencer	
	Through seminars	
	Yes	
	Yes there are	
	No response	
(blank) Total		175
Timing of seminar	<p>Absence of financial motivations; Wrong timing of seminars.</p> <p>Hardly punctual</p> <p>Il faut un temps bien précis, question -reponses</p> <p>La durabilité des formations</p> <p>La durée</p> <p>La durée du seminaire trop court</p> <p>la formation continue des enseignants devrait dès la rentrée et non au mois de novembre .</p> <p>Le nombre insuffisant des moyens utilisés pour la formation continue des enseignants : il faut au moins</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>une fois par trimestre .</p> <p>Les jours de séminaire sont mal placés dans la semaine, les séminaires doivent être payants</p> <p>Limited time for teaching practice.</p> <p>Not always timely</p> <p>Not punctual</p> <p>Not punctual à</p> <p>Notification period is always very short. No seminar materials are made available to teachers at the seminar.</p> <p>No logistics made available.</p> <p>Organiser les séminaires en temps libres</p> <p>Organiser Les seminaires/atelier pendant Les vacances</p> <p>Period of the seminar are always late . So is good for seminar to be held at the beginning of each academic year for proper implementation.</p> <p>Poor time management during the training period</p> <p>Poor timing of seminar s</p> <p>Re numération---temps reparti et thèmes choisi</p> <p>Seminar comes at the end of the school year.No financial ,etc,motivation.</p> <p>Seminars are held at the end of the academic year</p> <p>Seminars are not timely programed</p> <p>Seminars are not timely programd</p> <p>Seminars are supposed to be held in August to enhance a smooth start of the school year. So, I suggest that</p> <p>Seminars should be done at the beginning of the year and not at the middle of the year as almost always the</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>case.</p> <p>Seminars should be held during holidays before each term.</p> <p>Seminars should be in august to prepare teachers to begin the school well</p> <p>There is usually poor time management because the work the inspectors plan to teach teachers during seminars is never covered. As a consequence, when it is 3pm, the inspectors just rush through the remaining work and the teachers who are equally very tired just listen to them present the material the way they like.</p> <p>Seminars should be regular and timely</p> <p>Temps impart</p> <p>The period of holding seminars should be taken in to consideration so as not to interrupt the school program</p> <p>.</p> <p>The time is too short to master what is taught</p> <p>The time is usually short, while the work load is quit much,thereby making most seminars very tiring</p> <p>The timings of some seminars were not correct</p> <p>Time is usually poor.</p> <p>Time of the seminar,there are some semi</p> <p>Time schedule of seminar,</p> <p>Untimely schedule of seminar s</p>	
Timing of seminar		
Total		38
Didactic material	After seminar,they give handout to teachers	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	Computer illiteracy	
	La formation à l'enseignement des Tic	
	La formation sans support pédagogique pour faciliter la compréhension	
	La pratique du numérique	
	Lack of adequate didactic materials and inefficient illustration	
	Lack of material e.g	
	Lack of projector	
	Le manque de certains documents adaptés	
	Les ordinateurs	
	manque de matériels adéquats	
	Manque des matériels TIC	
	Materials are needed to properly train teachers to the understanding of everyone	
	Modern devices like projectors are not used in seminars.	
	Motivation,tic	
	No materials	
	Not enough resources and resources persons	
	Outils tic	
	Pas assez de documents bien élaborés	
	Poor environment used with lack of projectors and electricity	
	Teachers are not given handouts despite the payment done per participant	
	The absence of modern technology facilities like the	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	power point etc	
	Video conferences	
	Yes, handouts are not always provided to teachers to use in teaching and preparing presentations for seminars	
	Yes, inadequate material	
	Yes, sometimes seminar handouts are not given.	
	Yes. No logistics	
<hr/>		
Didactic material		
Total		27
<hr/>		
Cost	<p>1-financial extortion of teachers</p> <p>Distance entre l'école et le lieu de formation, l'hébergement , les moyens de déplacement et l'insécurité</p> <p>Éloignement du lieu de formation et difficultés d'y accéder</p> <p>Finances problem for some teachers</p> <p>Financial constraints</p> <p>Financial extortion of teachers</p> <p>Insecurities, means of transportation</p> <p>It comes with financial cost</p> <p>La non prise en charge de l'hébergement, la nutrition et le transport pendant le séminaire.</p> <p>La prise en compte des difficultés des enseignants, Le coût d'une formation supplémentaire</p> <p>Lack of finances</p> <p>Le non paiement des séminaires.</p> <p>Les finances , manque de personnels</p>	1

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>Schools pay for seminar. Individuals feed themselves</p> <p>Teachers are usually not able to buy working material.the training will be effective if material is shared to teachers after the workshop</p> <p>Teachers aren't supposed to pay for seminars. So many teachers don't attend because they believed government is supposed to pay for seminars.</p> <p>Too much extortion of finances from teachers</p>	
Cost Total		18
Lack of content		
Mastery	<p>Facilitators most often do not master the subject matter</p> <p>Incompetent resource persons</p> <p>It is usually overcrowded and the facilitator s sometimes have conflicting ideas</p> <p>Lack of facilitators</p> <p>Le mauvais choix des formateurs</p> <p>les compétences des formateurs ne sont pas toujours avérées</p> <p>Most doubts brought up by teachers, some are not clarify</p> <p>Nous avons souvent remarqué que ce n'est souvent pas la personne qui a préparé l'exposé qui le présente.</p> <p>presentations are too thereoritcal and resource persons seem to lack mastery as such depend on teachers for findings.</p> <p>Some of the teacher controlling the workshop do not master the contents very well</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
Lack of content	<p>Some of the teachers admitted for training are not qualified</p> <p>Sometimes the resource persons are not knowledgeable in the theme of the seminar</p> <p>Unqualified resource persons</p> <p>Yes, Many at times the facilitators contradictss one another in different occasions.</p> <p>Yes.Insufficient knowledge by the presenters. Lack of Didactics materials to dymestify the comprehension amongst teachers.</p>	16
Mastery Total		
No need analysis	<p>Il faut multiplier les formations et adapter les thèmes aux réalités du milieu</p> <p>Inadéquation des modules</p> <p>L'appropriation des nouveaux curricula n'est pas aisée</p> <p>Le fait de ne pas associer ceux qui sont au cœur cœur de l'action</p> <p>Les séminaires sont presque théoriques , les enseignants ne sont pas impliqués dans la formulation des objectifs, les méthodes utilisées sont des méthodes pédagogiques au lieu d'être andragogiques</p> <p>On a practical note the seminars do not aslways meet practical lessons</p> <p>Teachers are not consulted before choosing seminar topics</p> <p>Teachers' opinions are never seek to know their areas</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>of difficulty.</p> <p>Tenir compte des besoins des enseignants _tenir compte du choix des thèmes proposés par les enseignants.</p> <p>The follow up of the implications of resolution is always lacking and need analysis not always done to actually see what the main challenges of teachers are before deciding on seminar themes.</p> <p>Topics choosen during seminars are not really important for level one and also nursery should be separated from the primary level during seminars</p> <p>Yes most often the call for a seminar do not actually met the needs of the teachers.</p> <p>Yes, suggestions given by teachers are never put in practice.</p>	
No need analysis		
Total		13
Poor planning	<p>At least 2 teacher should be placed in a class to adviod class rooms without teachers and teacher, s distances should be taken into consideration.</p> <p>Coupure de lumière qui occasionne de perte de temps de formation.</p> <p>Le séminaire doit être organisé</p> <p>Manque de projection des activités</p> <p>Multiple sujets pour un séminaire.</p> <p>Organisms seminars and workshop.</p> <p>Poor accommodation, poor feeding</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>Some are not well planned</p> <p>Une bonne planification à l'avance</p> <p>Yes , because in case the DO and head from the regional daligation don't come they won't open the seminar hence time consuming</p> <p>Yes, because the sitting environment of the teachers are very insufficient...while some teachers are sitting inside others are sitting outside</p> <p>Yes,enough time is not given for research</p> <p>Yes,the sitting environment of teachers. something teachers sitting outside and others sitting inside</p>	
	Poor planning Total	13
Motivation	<p>Formation non motivée</p> <p>La documentation doit etre disponible. Desinterresser les seminaristes lors des ateliers ca decourage quand les promesses ne sont pas tenues.</p> <p>La motivation aux enseignants participants à la formation</p> <p>Lack of incentives, inaccurate curriculum, financial insufficiency</p> <p>manque de motivations aux enseignants</p> <p>Motivation financière</p> <p>Motivation is often very poor.</p> <p>No motivstion to teachers.</p> <p>Pas de motivation, thèmes non envoyés à temps</p> <p>Pas de motivation.</p> <p>Teachers are not motivated or encourage during the</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>period</p> <p>There isn't enough motivation.</p> <p>Yes. Teachers are not motivated</p>	
Motivation Total		13
Attendance	<p>Formation de quelques uns seulement</p> <p>Insufficient personal</p> <p>It is usually over populated</p> <p>Manque des enseignants</p> <p>Most teachers' are not aware of the importance of this activity and don't always attend.</p> <p>Not all teachers are used, making it not to be balanced.</p> <p>Moreso, the Pedagogic Animators are not involve which may not enhanced supervision.</p> <p>Poor attendance of teachers</p> <p>The number of teachers are usuall too many per seminar</p> <p>Yeah barrieyers on the way to meet up for the Seminar on time</p>	
Attendance Total		9
Feedback	<p>Absence du retour des données envoyées à la hiérarchie</p> <p>After summiting the workshop,teachers are controlled in the field if they implement everything effectively.</p> <p>As if seminars are organized to make money.</p> <p>Faible suivi et accompagnement</p> <p>La continuité des séminaires</p> <p>La non continuité des séminaires</p>	

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	<p>Le suivi des enseignants la discipline</p> <p>Manque de contrôle et suivi</p> <p>Most often appropriate feedback is not given</p> <p>Supervision</p>	
Feedback Total		9
Allowance provision	<p>Finances</p> <p>Lack of finance</p> <p>No transportation and launch breaks for participating.</p> <p>No adequate preparation teachers</p> <p>Projectors and other diadatic materials and food.</p> <p>Seminars are hardly funded</p>	
Allowance provision		
Total		5
Language barrier	<p>Language barear</p> <p>Language barriers in Cameroon</p> <p>Sometimes we have language barrier.</p> <p>The use of unfamiliar languages like french in English areas</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
Language barrier		
Total		4
Workshops	<p>seminars are mostly theoretical very little of practice to empower teachers to learn from the workshops .instead facilitators depend on teacher knowledge of new concepts instead of dissecting and illustrating concepts to facilitate application by teachers.</p> <p>Teachers should be allowed to come up with difficulty at the level of classroom to be discussed at the</p>	<p>1</p> <p>1</p>

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	seminars not been imposed on aspect to discuss at the seminars	
	Tout d'abord avoir une bonne disposition sonore parce-que parfois à certains séminaires on a du mal à suivre ce qui est dit;en plus se sont les thématiques qui reviennent ça l'air d'un perd temps	1
Workshops Total		3
Absenteeism	Encourages. absenteeism amongst pupils	1
	It encourages absenteeism among pupils.	1
	The interruption of classes for days which affects both teachers and pupils to cover up their activities	1
Absenteeism Total		3
Inclusion	Les enseignants ne sont pas documentés et ne sont pas spécialisés dans le domaine de l'inclusion.	1
	Seminars fo not always include all the teachers concern with the subjects.in most cases only HODs are made to attend seminars	1
Inclusion Total		2
Online sessions	Distance learning	1
	Les séminaires en ligne	1
Online sessions Total		2
Implementation	Does not ensure that what is agreed be implemented 4- opinions should be requested to schedule for the next seminar at all cost, 2-less time spend 2- same leader	1
	Yes.This is so because some teachers came in only to disturb;that is the make alot of noise and at the end of	1

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
	the day,not every teachers complain is taken into consideration	
Implementation		
Total		2
Work conditions	Les conditions de travail lors des séminaires	1
Work conditions		
Total		1
Coffee breaks	Pose café	1
Coffee breaks Total		1
Work overload	Multiplication des noms des sous disciplines et autres canevas de préparation qui embrouillent l'enseignant dans sa tâche quotidienne	1
Work overload		
Total		1
Permission obtention	Not all teachers attend seminars and some proprietor stop teachers from going to seminars	1
Permission		
obtention Total		1
Repetition	Yes. Topics often repeated	1
Repetition Total		1
Theoretical		
knowledge	Le manque d'exemple pratique	1
Theoretical		
knowledge Total		1
Mostly theories	Lack of practical methods	1
Mostly theories		
Total		1

Theme	Are there other weaknesses in using Seminars and workshops to ensure the in-service training of teachers? If yes, please write them in the space provided	Grounding (frequency)
Grand Total		359

OBJECTIVE TWO

SN	Themes	Count of Themes
1	Didactic material	39
2	Learner centered	27
3	Online	23
4	Timing	22
5	Proper planning	14
6	Need analysis	13
7	Motivation	9
8	Workshop sessions	8
9	Follow up	7
10	Allowance	5
11	Trained facilitators	3
12	Cost	3
13	Online and onsite	2
14	Rotatory design	2
15	Flexibility	2
16	Frequency	1
17	Co-curricular	1
18	Refresher	1
19	(blank)	
	Grand Total	182

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
Didactic material	Accommodation, handouts or booklets for references	1
	All schools should be provided with teaching learning materials	1
	Android	1
	Audiovisuel , pragmatique et support physique	1
	Chaque enseignement devrait recevoir un document numérique ceci lui permettra d'être intéressé , de mieux s'appliquer dans son domaine	1
	Conception des contenus dans des documents à vendre moins chers	1
	Create WhatsApp in service training group to better train teachers	1
	Doter les enseignements des outils informatiques	1
	Format vidéo ou PDF	1
	Forum, vidéos, audio, documents physiques	1
	Giving out handouts at the end of the training	1
	Hand outs ss	1
	Hand outs should always be given to teachers	1
	Handouts be given out for free	1
	Handouts should be given for free	1
	ICT devices regards	1
	ICT should be taken care of seriously.	1
	Les documents en PDF envoyés à l'avance	1
Make use of icts	1	

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	mes préférences:sous formats pdf,vidéo,face à face et à distance.	1
	Most of it should be taught with teaching aids, concrete hand outs given	1
	Multiplier les supports audio-visuels et les supports PDF .	1
	Par format vidéo. A défaut, par format Microsoft, web, PDF ou face à face mais pas à distance.	1
	Provision of teaching/learning materials to all the schools	1
	Seminar,vedio conference, handouts	1
	Support numérique, audiovisuel..	1
	Téléphone mobile	1
	They should provide materials to teachers	1
	Time and materials should be available for all	1
	Un appareil audio	1
	Use of didactic material	1
	Utilisation Des ordinateur	1
	Video programs	1
	Video conferences,electronic print.	1
	We need logistics to compliments the seminar.	1
	WhatsApp	1
	WhatsApp,pdf, vidéos.	1
	Yes they should give them the package immédiatly after thé training	1
	Yes,, writing materials,, handouts,	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	accommodation and transport facilities ect should made available to the authority concerne	
Didactic material Total		39
Learner centered	Academic levels of Teachers should be taken in to consideration when designing the program	1
	Academic levels of Teachers should be taken in to consideration when designing the program.	1
	Academic qualifications	1
	All teachers be targeted, Pedagogic Animators involved, pupils characteristics be rehearsed.	1
	Consider the teacher's longevity in service	1
	Every teacher should be provided with a model lesson	1
	Face to face contacts will be the best , because mistakes can be easily corrected	1
	General topics be discussed to everybody while specific topics are presented following the levels	1
	It should be done per level	1
	It should be gradual,	1
	Méthode syllabique de où dogmatique	1
	Teachers be trained to be computer literate	1
	Teachers be updated on the use of mobile garget	1
	Teachers' in rural areas should be given highest	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	consideration	
	Teachers individual weaknesses should be taken into consideration .it should be made compulsory for all teachers.	1
	Teachers should be given the required material needed for use	1
	Teachers should be involved	1
	The in-service training should be learner centered	1
	The topics chosen should be applicable in Urban, semi. Urban rural and semi rural areas.	1
	The workshop should tie with the need of the giving society	1
	They should tell us what they will teach us before time	1
	Topic should be sent to teachers before seminar so that they bring in their ideas and also for better understanding.	1
	We should consider the local realities	1
	Yes,connectivity and swift communications trend	1
	Yes.During in service training, teachers should be	1
Learner centered Total		27
Online		
	Audio visual -web based	1
	Creation of WhatsApp groups for easy updates	1

Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.		
Themes		Count of Themes
	and quick discussions	
	E learning system	1
	Formation continue en vidéo, ou face à face	1
	Groupe WhatsApp, images vidéos,	1
	Le e_learning	1
	Par vidéo conférence.	1
	Teleconferencing	1
	Utiliser la plateforme	1
	Video	1
	Video ,	1
	Video conference s	1
	Video conferences	1
	Video conferencing	1
	Video preferences	1
	Video preferences	1
	Video, WhatsApp	1
	What sapp	1
	WhatsApp	2
	WhatsApp .	1
	WhatsApp video	2
Online Total		23
Timing	At the beginning of the academic year	1
	Compte tenu du temps qu'on organise les ateliers pendant les vacances	1
	During holidays	1
	Everything should be available to teachers and on time	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	Give time to study	1
	If in- service training of teachers can be carried out terminally it will be good so that the teachers brains are refreshed always	1
	In-service training should be timely so as not to interrupt the school program while focus should be on addressing immediate and long term education goals.	1
	Les journées pédagogiques	1
	More time given for the serrminer	1
	One day in-service training is insufficient to handle everything probably. Sometimes teachers abandoned the seminar as if they came to answer present.	1
	Regular seminars at the beginning of the school year.	1
	Simple language and short	1
	Teachers in the hard to reach areas should be informed atleast two weeks ahead of time hould be informed atleast two weeks ahead of time	1
	Teachers should be alerted for some time, maybe a week before an in-service takes place.	1
	The period of training should chosen wisely	1
	The time and the period allocated should be the one that will not disrupt class activities	1
	The time should be convenient for the in-service training teachers	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	This should be done during holidays and not school hours	1
	Timing and problems faced during that period	1
	Yes, the best time to organise teacher's seminar is in 1st term	1
	Yes, Number of days, hours and adequate materials for the training	1
	Yes. In service training should be done by first week of reopening.	1
Timing Total		22
Proper planning	Accommodation for teachers	1
	Chose a secured venue, information on seminar be sent earlier, schedule enough time for each topic during presentation	1
	Distance from school should be considered and financial motivation should be given to participants always	1
	Good accomodation	1
	It should be held in the rural areas because most teachers find it difficult to move from their local area to attend seminar and lodging is also a factor to consider	1
	Logistics should be taken care of. The venue should be conducive in terms of comfortable seats, ventilation and the presenters should do peer review before come to present	1
	Planning ahead of time and letting us teachers	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	be aware	
	Take into consideration distance	1
	Tenir en compte de l'environnement ⁸	1
	The environment of the seminar should be conducive enough where teachers will feel at ease, good speakers and projectors be provide and above all pay the seminar participants.	1
	The environment, resources available, the level they teach, and academic qualification.	
	ilabilible,	1
	The location of the training center	1
	There should be improvement of telephone network in the rural areas.	1
	They should take into consideration the environment, learners ability, financial support, n making it be accessible	1
Proper planning Total		14
Need analysis	A working population should be available for scientific research concerning in-service training	1
	Ask their weaknesses firs	1
	Certain facility should be check if everyone has it, example,all attaining training have an Android phone? Are they visually balanced and their mode of transportation	1
	Each participant should be asked to come alone w school problem & individual difficulties as	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	well,2- private schools should strictly be observed because they do disturb alit.	
	It should be noted that most teachers are out network. of	1
	Longivity in service should be considered	1
	Nursery school should be taken into consideration because they are always ignore so	1
	Opinion of teachers should be taken into consideration	1
	S'arrimer au contexte	1
	teachers ideas should be sampled and themes drawn from the difficulties teachers face like wise athe mode of oresentation should take into account the challenges of teaching a diversified classroom as well as designing a curriculum that is appropriate for all kinds of learners of teaching	1
	The government should organize a special training on Head teachers on how to managed PTA money	1
	When selecting topics for in service training emphasis should be laid on the reality of the Country, the region and the locations	1
	yes ,the state should take in to considration the different levels at which teachers teach because teaching level one is different from teaching	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	level two. How then can they just join every body in the same hall. At times they even join level three teachers with nursery school teachers. Are their problems the same?	
	grouped in two categories that's trained teachers grouped in a different angle ,and untrained teachers in another angle so that emphases can be laid profoundly in untrained teachers.	
Need analysis Total		13
Motivation	Financial support	1
	Il faut rémunérer les sessions de formation	1
	It should be affordable and motivated	1
	Motivated	1
	Motivation	1
	Of course, teacher's motivation should be taken into consideration	1
	Teachers be sponsored I	1
	Teachers should be motivated. If not at least by providing the basic needs such as taxi faire.	1
	Transportation should be available	1
Motivation Total		9
Workshop sessions	Appropriate time should be given to work on the topic	1
	La pratique	1
	Rehearsal of pupils characteristics and method	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	of learning	
	Travail de groupe	1
	Travailler avec des personne plus experimentees	1
	Yes more of practice than theory	1
	Yes. The teachers who are involved in the in service should be given the opportunity to also present during seminars	1
	yes.inservice training should take into account practical modalities in handling a diversified class with the advent of inclusive education and hiw teacher can develop their monthly schemes with practical illustrations to empower teachers.the issue of oreoaring evaluation items following the bew system is still a gigger in the toes f teachersr	1
Workshop sessions Total		8
Follow up	Effective automatic of advancement and intergration	1
	Follow up activities	1
	Le coaching permanent par les superviseurs pédagogiques	1
	L'évaluation personnelle de chaque enseignant	1
	Suivie régulier des enseignants	1
	Take into consideration the feedback from the field not just coming with any topic because some are monotonous	1

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	The content should be rich enough to meet the training needs, It should be easy to understand. There should be constant follow-up to ensure strict implementation.	1
Follow up Total		7
Allowance	Package for teachers should be equal	1
	Package for teachers should be equal.	1
	Resources should be provided to teachers as well as finances	1
	Teachers should be transported, fed and provided seminar materials.	1
	Yes in-service training should be made easier for teachers to attend by giving them subsidies for transportation and others .	1
Allowance Total		5
Trained facilitators	Lack of facilitators	1
	Resource persons should be persons not from our region	1
	Yes. In service training should be done by teachers trained for that	1
Trained facilitators Total		3
Cost	There shouldn't be any tax	2
	Yes. Thier security first, training should be free	1
Cost Total		3
Online and onsite	Je préfère un modèle mixte : audiovisuel et en présentiel	1
	Physique et numérique	1

Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.		
Themes		Count of Themes
Online and onsite Total		2
Rotatory design	Avoid repetition	1
	There should be rotatory design for the in-service training	1
Rotatory design Total		2
Flexibility	It should be flexible	2
Flexibility Total		2
Frequency	Multiplier les séances de formation continue	1
Frequency Total		1
Co-curricular	I propose that teachers should be given the opportunity to carry out sporting activities like handball and football .	1
Co-curricular Total		1
Refresher	Internet should be readily 2 mobile gadgets should be made available.3.Orientation and refresher courses on mobile gadgets	1
Refresher Total		1
(blank)		1

999

No

Formation sur video, a distance et face a face, decouper les themes en sous themes pour meilleure comprehension.

Hm should handing numbers of PTA teachers to work together in unity

I have nothing here

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
	It is good.	
	It's ok	
	It's preferable	
	N'importe lequel	
	No	
	No	
	No idea in mind.	
	No ideas	
	Non	
	Non go TTC	
	Non.	
	None	
	Nope	
	Not exactly	
	Not inspired yet.	
	Not now	
	Nothing to be added.	
	Nothing to offer	
	Orientation politique dans la conception	
	Pas vraiment de préférence, du moment où nos capacités sont renforcées.	
	RAS	
	sais pas.	
	Teac	
	The seasons.	
	Yes	
	(blank)	

Themes	Are there other ideas you like to be taken into consideration when designing and in-service training package for teachers? If yes, please write them in the space provided.	Count of Themes
(blank) Total		
Grand Total		182

OBJECTIVE THREE

SN	Theme	Count of Theme
1	Timing of seminar	38
2	Didactic matirial	27
3	Cost	18
4	Lack of content	16
	Mastery	
5	Motivation	13
6	No need analysis	13
7	Poor planning	13
8	Attendance	9
9	Feedback	9
10	Allowance provision	5
11	Language barrier	4
12	Workshops	3
13	Absenteeism	3
14	Inclusion	2
15	Implementation	2
16	Online sessions	2
17	Work conditions	1
18	Theoretical knowledge	1
19	Repetition	1
20	Work overload	1
21	Permission obtention	1
22	Coffee breaks	1
23	Mostly theories	1
24	(blank)	
	Grand Total	184

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
Timing	Constant follow up as with the military	1
	Formation continue	1
	Having seminars	1
	I service training as with the forces	1
	I service training should be done as with the forces	1
	In-service should be at least three times a team	1
	In-service training as with the military	1
	Inservice training as with the military	1
	In-service training for teachers like with the military	1
	In-service training just as with the military	1
	Inservice training should be continuous.	1
	La formation continue des enseignants	1
	La formation continue et réguliere des enseignants	1
	La formation continue, la motivation des enseignants	1
	Les séminaires doivent être continus	1
	Many seminars should be organise	1
	Metre un absent particulier sur les formations	
	continues.	1
	More workshops should be held at the right time	1
	Multiplier les séminaires de formation	1
	Need for in service training	1
	Organisation des formations continues tous les	
	trimestres	1
	Policy on the regularity of in-service training.	1
	Privilégier la formation continue pendant les congés et	
	motiver financièrement.Sortir d'une attestation de fin	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	de formation.	
	Rattacher les enseignants a de differents poles ou ils devront avoir une formation continue	1
	Refreshing courses should be constantly	1
	Séminaire visant le développement professionnel d'une durée minimum de 3 mois	1
	The government should carry out in service training regularly and make motivation to teachers always to ensure a good out put	1
	The training should be continiously so that teachers will learn more	1
	Toujours plus de formation continue et payantes	1
	Travailler sur un thème une fois le mois	1
Timing Total		30
Provide allowance	Any financial dues for participants shall be signed out by the concerned in a nearby treasury to avoid avoid cheating.	1
	Commencez d'abord a mettre à l'aise l'enseignant	1
	Finances	1
	Financial assistance	1
	Fixed incentive should be given to participant to ensure effectiveness in their activities	1
	La politique de récompense : il faut recommencer ceux qui font bien le travail demandé.	1
	La récompense pour les enseignants travailleur	1
	Le paiement des séminaires donner aux enseignants des pauses café pendant les séminaires.	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	Motivation	1
	Motivation	1
	Motivation exponentielle des enseignants	1
	Motivation, nomination,	1
	Reclasification, Integration, Appointment and even allowances.	2
	Teachers should be motivated both financialy and materialy to enhance good work ant time	1
	Teachers should be motivated during the period	1
	Teachers should be motivated when attending seminars like other ministries	1
	There should be financial allocation for teachers to use during in-service training for transportation and upkeep	1
	Transport and logistics should be included	1
	Yeah, the government should formulate law which can grant free circulation of teacher's bike or offer special bikes which can permit free movement and avoid embarrassment at check points.	1
Provide allowance Total		20
<hr/>		
Needs analysis	Academic levels of Teachers should be taken in to consideration when designing the program	1
	Academics levels of Teachers should be taken in to consideration when designing the program .	1
	Career profile should be strictly respected.	1
	Culture of all the regions should be considered	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	Give open opportunities for teachers to come up with topics they're facing difficulties	1
	L'application effective de textes sur les nominations sur la base de la performance, la compétence et ou l'ancienneté	1
	L'enseignement devrait être adapté selon les attentes et les besoins du milieu ou de la région	1
	Nursery education should always be considered during seminar / in-service training Programs.	1
	Politique de proximité et surtout d'échange mutuelle en tenant compte de l'opinion des bénéficiaires.	1
	Tenir compte des réalités de chaque localité lors des formations continues	1
	The government could train head teachers how to supervise and give report on those who are lagging behind, and also include PTA teachers.	1
	The training should reflect the needs of the teachers.	1
	They should also be broken down to suite the different levels	1
	Topics for in-service training for teachers. should reflect the needs of the society.	1
	un modèle centré sur la résolution des problèmes et le développement des compétences professionnelles	1
	Une politique qui pr Give open opportunities for teachers to come up with topics they're facing difficulties end en compte les réalités socioculturelles du milieu dans lequel l'enseignant évolue.	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	yes government should develop a curriculum that takes into account the needs if a diversified classroom setting	1
	Yes, the Government should take into consideration the sub-system of education and also consider the rural areal	1
Needs analysis		
Total		18
Didactic material	Accompagner les enseignants des documents des séminaires ou de la formation continue	1
	Encourage research through the use of I.C.T tools with internet connection	1
	Éviter de séparer les familles, rendre toutes les écoles inclusives et les équiper.	1
	Handout shield	1
	Lodging facilities	1
	L'utilisation effective des TIC et une formation continue en institut.. suivie d'un coût à la portée des enseignants.	1
	Make use of icts	1
	Mise sur pied d'une session de formation à l'utilisation des outils TIC	1
	Policies regarding the use of audio visual aids and financial policies	1
	Provide teachers with android phones	1
	Provision of didactic materials and usage	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	Teaching equipment such as computers, musical instruments, image projections to enhance and facilitate teaching learning process.	1
	The government should provide all facilities needed for in service training	1
	The use modern technology	1
	There should be advanced technological gadgets and intensive practical work done on the usage. L	1
Didactic material Total		15
Certification	An attestation or certificate be awarded to teachers who have successfully completed In-service trainings for a period of time as deemed necessary by the government.and this certificate should be a track records for appointments and promotions.	1
	Certificates should be awarded after in service training.	1
	Certificates should be awarded after in-Service	1
	Come up with a evaluation scheme that will permit the certification of those indulging in in-service training	1
	Provide certificates for trainees after the training process	1
	provide training certification	1
	The government should give award as a means to motivate teachers	1
	The government should make a policy to issue attendance certificate y	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	The policy of improving professional grade and Bn promotion after attending well structured seminars, There should be a an update of every teachers portfolio every year in their institutions	1 1
Certification		
Total		10
<hr/>		
Timing	<p>In service could take place before school reopens in the first Term.one month to reopening is good for complete application in year.</p> <p>In-service training or seminars should be organized a week before assumption of the school year to enable teachers fully participation and enough time.</p> <p>Most in-service training workshops should be scheduled during holidays so as to allow teachers cover their schemes within the stipulated time.</p> <p>Motivation and constant seminar at the beginning of the year</p> <p>Organization of early seminars.</p> <p>Seminar programs should come up during the summer holidays, working condition of teachers be improved, participation be free.</p> <p>seminar should be held in every August of the year and participants be compensated for movements and others.</p> <p>Seminars be organized during summer holidays;</p> <p>Teachers working conditions be improved; Semi</p> <p>Teachers in hard to reach areas should be informed</p>	1 1 1 1 1 1 1 1 1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	atleast two weeks ahead of time	
	There should be a clear period allocated for in service training	1
Timing Total		10
Ensure		
attendance	All teachers should participate in training	1
	Emphasis should be laid on lay private institutions	1
	Ensure the availability of many personnels for in-service training.	1
	In-service training should be made compulsory for all teachers	1
	It should be made compulsory for all teachers.	1
	It should made compulsory to all the public and private schools. On that day all schools closed down.	
	Schools that are absent should be sanction by the government	1
	Obligatory to all teachers,distances of	1
	Participation us obligatory to all those concerned	1
	The government should encourage teachers to undertake in service Training	1
	The government should make sure all teachers attaind in-service training	1
Ensure		
attendance Total		10
Recruitment	Graduate from Government Teacher Training College should be trained and absob by the Government.	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	L'intégration à la sortie de l'ENIEG, l'automatisation des actes de carrière des enseignants	1
	More teachers should recruited and sent to public schools that are in dere nee	1
	Nommer, payer les enseignants	1
	Prise en charge rapide des enseignants formés	1
	Regular recruitment and motivation of teachers.	1
	To recruit teachers	1
	Trained teachers should be recruited directly into the Public service with out writing any examination	1
	Training them for at least 2 years, then directly employment.	1
Recruitment		
Total		9
Salaries	Amélioration de la condition salariale	1
	Amélioration des conditions de vie des enseignants	1
	Améliorer les salaires des enseignants , traiter automatiquement les avancement et tous les autres besoins des enseignants	1
	Augmentation de salaire de enseignants	1
	Augmenter le salaire et élaborer un program qui prend en compte les besoins des camerounais	1
	Bien traité les enseignants.	1
	Hausse de salaire	1
Salaries Total		7
Good planning	Good and conducive halls should be provided inorder for workshops to be done perfectly	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	It should be nearer the teachers	1
	Le choix d'une bonne méthode et sa pérennité	1
	Security policy	1
	The government should put down policies on security of teachers, they should	1
	The venue should be codusive	1
	They should not maltreat teachers during I'm service Training	1
Good planning		
Total		7
Award to teachers	Encourager les travailleurs et décourager davantage les paresseux	1
	L' ancienneté au poste,encourager ceux qui font vraiment des efforts en les primant ,	1
	La motivation des meilleurs enseignants	1
	Primer les enseignants dans leurs activités d'enseignement	1
	Teachers should be upgraded after a designated period of time	1
	Teachers who reach great heights in teacher development programs should be rewarded with appointment to a leadership position	1
Award to teachers Total		6
Reality	Des séminaires théoriques et pratiques	1
	Il faut prendre en compte les réalités du terrain ; étant donné que que les environnements de travail ne sont	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	pas les mêmes partout	
	Policies should be real and attainable	1
	presentations should practical in approach and using a variety of inputs to facilitate understanding and application	1
	They should take into consideration the reality on the field	1
	Une politique de modèle pratique	1
Reality Total		6
Follow up	Maintenir les enseignants au poste pour 5 pas plus pas moins,doter les écoles des enseignants,la supervision doit être centrée sur l'accompagnement ,doter les superviseurs de tous les maillons des moyens pour descendre régulièrement sur le terrain.	1
	Suivi continu et encouragements , veiller au paiement de l'argent que l'Etat se donne la peine d'octroyer aux enseignants,affecter les enseignants la où besoin est , veiller que chacun fasse son travail et soit en poste	1
	There should be a monitoring team to ensure perfection	1
	Yes. Teachers status after the in-service training should be made known to them	1
	Yes.In my opinion I will say that the government should implement effective follow-up after each training session so that the teachers can actually put into practice what they had learnt during the in service	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	training.	
Follow up Total		5
Trained		
facilitators	Bring experience trainees	1
	In-service training should be done by more experience teachers	
	The inspectors should first of all be made to understand what they want to come and teach teachers. There are some inspectors who just go and cram things to be telling teachers. When the teachers ask them a simple question, they will not be able to answer and the other inspectors will just start confusing people	1
	Respecter la régionalisation lors des recrutements, Faire une enquête de moralité afin de recruter ceux qui aiment le métier.	1
	The govemnt should make sure that those put in charge of these in-service training are well experiened and master their subjects.	1
	Yes. Send international presenters,	1
Trained facilitators Total		5
Inclusive		
education	Age should not not be a barrier	1
	Designers should consider learner's in rural areas when formulating such policies and the rural environment	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	too	
	Inclusive education	1
	It should involve all the teachers	1
Inclusive education system automation		4
	Effective and automatic advancements and integration	1
	Effective automatic advancement and integration should be implemented	1
	Le système d'automatisation des dossiers du personnel	1
automation system Total		3
Allocate budget	Budgets should be put in place for seminar workshops	1
	Funds and time should be included	1
	The policy of providing materials or resources... both financial and human resources	1
Allocate budget Total		3
Teacher recycling	Resyclage des enseignants chaque 3 mois	3
Teacher recycling Total		3
Rotatory design	Always move around schools	1
	The government should come out with a time table on how teachers will be trian	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	Yes, the venue of seminars should move from one school to the other	1
Rotatory design		
Total		3
ICT trainings	All teachers should be computer literate	1
	All teachers should be computer literate	1
	La formation efficace et efficiente aux outils informatiques	1
ICT trainings		
Total		3
Cost free	No money should be collected from teachers	1
	Provide teachers with free seminar materials at the end of the each seminar.	1
	Teachers must not be compelled to pay for in service training	1
Cost free Total		3
Leave motivation	Opportunities for further studies, equipments made available to all teachers.	1
	Study leave and motivations	1
	Teachers should be given the opportunity to go further studies	1
Leave motivation Total		3
Improve teaching conditions	Ameliorer les conditions des enseignants	1
	Pour améliorer	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
Improve teaching conditions Total		2
Strengthen biligualism	Interprétation of training teachers	1
	The policy of bilingualism	1
Strengthen biligualism Total		2
Justice	Justice should be maintained	1
	Justice should be maintained in the system	1
Justice Total		2
Multiple platforms	Yes.Create other platforms for the this training.	1
Multiple platforms Total		1
Relevance	The training should be competent based approch to enable teachers better equip pupils	1
Relevance Total		1
Online	Establishing zoom meetings for remote in-service teacher trainings	1
Online Total		1
Respect teachers	Politique de ventre affamé n'a point d'oreilles pour parler du développement il faut que tous les droits des enseignants soient resp	1
Respect teachers Total		1
Distance	Training on distance learning	1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
learning		
Distance learning Total		1
Revise educational system	La révision totale de cette politique vu l'évolution de l'éducation inclusive au Cameroun	1
Revise educational system Total		1
Diversity	The state should also include arranging seminars on arts and craft including home economics in the in-service training of teachers	1
Diversity Total		1
Closing ceremony	A cocktail party should be organized at end of each training.	1
Closing ceremony Total		1
Value teaching	Insure those in training should take teaching as a vocation	1
Value teaching Total		1
Workshop sessions	Seminar workshop s	1
Workshop sessions Total		1
coffee breaks	Breakfast and lunch should be provided	1
coffee breaks		1

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
Total		
Location	Seminars should be held in all the suburbs. Facilities should be provided for teachers to implement what they have learned., all teachers should should be able to attend a seminars through one means	1
Location Total		1
(blank)		999
	<p>No</p> <p>All teachers whether teaching in rural or urban areas are due for same opportunities after in service training.</p> <p>Bien</p> <p>Fiscal policy</p> <p>I don't think</p> <p>I think what is in ae is practically fine</p> <p>Insurance companies should commit themselves t</p> <p>La politique democratique</p> <p>La sensibilisation,les radios communautaires</p> <p>Learning should be step by step</p> <p>Method demonstrative</p> <p>No</p> <p>No</p> <p>No idea in mind.</p> <p>No ideas</p> <p>Non</p> <p>Non for now</p> <p>None</p> <p>None</p>	

Theme2	Are there other policies you think the government should make as far as the in-service training of teachers is concerned? If yes, please write them in the space provided.	Count of Theme2
	None for now	
	Not	
	Nothing	
	Ok.	
	Oui	
	Par sensibilisation, les radios communautaires,	
	Politique Claire	
	Politique d'encadrement de proximité.	
	Ras	
	Rien à signaler	
	Still to come out with	
	Teacher should be given the opportunity	
	The program should be a broad base	
	The State should	
	Vu les différentes raisons les états généraux de l'éducation nationale pourront	
	Yes	
	(blank)	
(blank) Total		
Grand Total		201

APPENDIX III

TRAINING MODULE FOR INTERACTIVE MOBILE TECHNOLOGY MODEL FOR TEACHER PROFESSIONAL DEVELOPMENT

PERIOD	MODULE	SPECIFIC OBJECTIVES	MODE OF DELIVERY
WEEK 1	Training on the use of the Teacher professional Development mobile platform	From a mobile platform on TPD through explanation, interactions and practice by the end of the module, participants should be able to conveniently use the TPD mobile platform conveniently.	Face-to -face
WEEK 2	Preamble of an individual lesson plan	From videos and a text on the preamble of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to; <ul style="list-style-type: none"> - State the elements of a preamble of an individual lesson plan - Write the preamble of an individual lesson plan 	online
	Setting Instructional Objectives	From the criteria of setting instructional objectives, through discussions, presentations and questioning, by the end of the module, participants will be able to: <ul style="list-style-type: none"> - State the criteria of setting instructional objectives - State an instructional 	Face-to -face

		objective clearly	
Week 3	Teaching Methods	From illustrations and demonstrations, by the end of the training, participants should be able to effectively use teaching methods in the instructional process	Face-to-face
Week 4	Introduction/Revision stage of an individual lesson plan	From videos and text on the revision stage of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to; <ul style="list-style-type: none"> - Explain the 2 types of revision to be carried by a teacher - Prepare the revision stage of an individual lesson plan 	online
Week 5	The Presentation stage of an individual lesson plan	From videos and text on the presentation stage of an individual lesson plan, through illustration, discussions and questioning, by the end of the module, participants will be able to; <ul style="list-style-type: none"> - State the sub stages of the presentation stage of an individual lesson plan - Draw the presentation stage of an individual lesson plan 	online
Week 6	Evaluation stage of an individual lesson plan	From videos and a text on the evaluation stage of an individual lesson plan, through illustration, discussions and questioning, by the end of the module,	

		participants will be able to; <ul style="list-style-type: none">- Explain the link between the specific objectives and the evaluation stage of an individual lesson plan- Prepare the evaluation stage of an individual lesson plan	
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