

**ONLINE PROFESSIONAL DEVELOPMENT: SECONDARY
SCHOOL TEACHERS' BELIEFS AND INFLUENCE**

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**Submitted in fulfilment of the requirements for the degree of Doctor of
Philosophy in the School of Education University of KwaZulu–Natal**

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Declaration

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Ethical considerations



11 November 2014

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Protocol reference number: HSS/1454/014D

Project title: Secondary school teachers' beliefs about online professional development: a mixed method approach.

Dear Mr Flore

Expedited Approval

In response to your application dated 03 November 2014, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL**.


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I take this opportunity of wishing you everything of the best with your study.

Yours faithfully


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Abstract

The current traditional face-to-face professional development (PD) for teachers has proven to be ineffective, being fragmented and not related to their needs. Online professional development (OPD) is an alternative method of providing ongoing PD where teachers can learn at anytime and anywhere, at their own pace, in spite of their busy schedules. Exploring secondary school teachers' beliefs about OPD, is therefore the purpose of this study. The objectives are to ascertain secondary school teachers' beliefs about OPD, explore the facilitating and inhibiting factors influencing their beliefs about OPD, analyse how these beliefs are constructed and why teachers have such beliefs. As the current traditional face-to-face teachers' PD programmes seem to be ineffective and most teachers in Mauritius attend such PD programmes. The model of Unified Theory of Acceptance and Use of Technology (UTAUT) and model of teacher learning have been used as lenses for exploring teachers' belief about OPD.

An exploratory sequential mixed-methods and case study methodology was used for the gathering of qualitative data then quantitative data to generalise the findings to a larger population. The case study involved three focus groups of five participants each. Three themes emerged from the interpretive analysis: teachers' experiences with teaching training programmes, online teacher training use behaviour; and challenges of online teacher training. A questionnaire was developed from the qualitative findings to collect data for the quantitative study phase from a sample of 65 teachers and analysing the data using inferential statistics.

This study confirms that in the 21st century, teachers need technological pedagogical content knowledge. Therefore, it proposes a shift from traditional face-to-face PD to an online PD (OPD) for secondary school teachers, where they have control over their learning in terms of time, place or speed. This is because the former is too theoretical and offered in one-size-fits all mode, its content does not satisfy teachers' needs, and they are thus not helped to grow and progress professionally. But teachers need immediate and specific solutions to their classroom problems. Thus, PD is not promoting professional growth and progress. A multiple regression analysis result shows six predictors of online teacher training use behaviour. These are: content and activities, performance expectancy, behavioural intention, facilitating conditions, effort expectancy and evidence of students' performance.

It also shows that social influence is no longer a predictor of behavioural intention nor of online teacher training use behaviour. Finally, this study proposes a model for explaining the participation of secondary teachers in OPD.

Key words: Mixed methods, online learning, professional development, OPD, teachers' beliefs, online teachers training, online professional development

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List of Abbreviations

B.Ed	Bachelor of Education
BEC	Bureau de l'Éducation Catholique
CERA	Collaborative construction of understanding; Enactment of new practices in classrooms; Reflection on practice; and Adaptation of materials and practices
KM	Kreol Morisien
MIE	Mauritius Institute of Education
OPD	Online professional development
PCK	Pedagogical content knowledge
PD	Professional development
PGCE	Postgraduate Certificate in Education
PRB	Pay Research Bureau
PSEA	Private Secondary Education Authority
PSSA	Private Secondary School Authority
SeDEC	Service Diocésain de l'Éducation Catholique
TPD	Teacher professional development
UOM	University of Mauritius
UTAUT	Unified Theory of Acceptance and Use of Technology

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CHAPTER ONE: BACKGROUND AND CONTEXT

1.1 Introduction

In this chapter an outline of the background to the study is provided. It consists of 10 sections. **Section one** offers a comprehensive view of the Mauritian teacher development landscape; while **Section two** focuses on the origins, positioning and purpose of the current study which explores teachers' beliefs about online professional development. **Section three** deals with the internet and professional development. **Section four** describes the problem statement. **Section five** focuses on the professional implication of the study. **Section six** is an indication of the methodology used. **Section seven** elaborates on the delimitations of the study. **Section eight** deals with the researcher's bias. **Section nine** provides the definitions of the key terms. **Section ten** gives a preview of the following chapters.

The study, with Mauritius as the backdrop, hopes to add knowledge to teachers' beliefs about online professional development at the level of secondary school.

1.2 Background to the study

One of the major components of educational change (Villegas-Reimars, 2003) and advancement in the educational sector (Vo & Nguyen, 2010) is teacher professional development (TPD). The Mauritius Institute of Education (MIE), set up in 1973, has as one of its main functions the provision of TPD courses. It has remained the major provider of TPD in Mauritius since then. The MIE offers courses leading to Teacher's Diploma Secondary, Bachelor of Education, Master in Education and Post Graduate Certificate in Education among others. Some of these courses are run entirely by the MIE and some others jointly with other local and foreign universities as well as other institutions. Teacher's Diploma Secondary courses used to be offered to teachers who were employed in secondary schools with a Higher School Certificate (HSC). This started prior to 1998 as private secondary schools were allowed to employ HSC holders as teachers. After completing their Teacher's Diploma, teachers can enrol for a Bachelor of Education programme and then a Master in Education. Teachers who join the teaching profession with a degree can enrol for a Post Graduate Certificate in Education (PGCE) to acquire pedagogical content knowledge and pedagogical knowledge. Other institutions, local and overseas, have joined in to deliver

PD courses to provide more opportunities to teachers as at the MIE cannot respond to all demands for PD courses. Moreover, the MIE was not an awarding institution until 2017. The PD courses are conducted in blended learning and face-to-face mode.

In the traditional face-to-face mode, teachers have to travel from their workplace to attend their respective courses. They are absent from the classes for the course duration (Deane, 2006). This may cause a disruption in the smooth operation of the school as teachers need to be out of classrooms during school hours (Brooks-Young, 2001; Wayne et al., 2008). As the institution providing the PD courses is too far from the school, many teachers have to leave the school early to attend these in-service part-time courses (after working hours) for two to three years, depending on their level. But as seats are limited at the MIE, other institutions have started to provide professional development courses as, for example, the Centre for Innovative Lifelong Learning (CILL) – a department of the University of Mauritius (UOM).

CILL, previously called Virtual Centre for Innovative Learning Technologies from UOM, offers a Master in Technology. This course, delivered in blended mode, was first launched in 2004 as Master of Science (MSc) in Computer-Mediated Communications and Pedagogies. It changed to Master in Educational Technology in 2008.

In 2009, the MIE started to deliver an Educators' Licence course, blending face-to-face and online mode. This course targets teachers who have joined the profession with a degree and have not gone through PGCE courses to acquire some pedagogical skills. Teachers are encouraged to enrol in this course as it was a recommendation made in the 2008 in the Pay Research Bureau (PRB) report. The PRB is an independent institution under the aegis of the Prime Minister's office. Its role is to review continuously (based on the input of the stakeholders) the pay and grading structures, conditions of service and organisational structures to ensure excellence in service delivery in the public sector and the parastatal bodies. Teachers in private schools (schools owned by individuals, trust companies or Confessional Schools) work under the control of the Private Secondary Education Authority (PSEA), formerly Private Secondary Schools Authority (PSSA) a parastatal body. The mission of the PSEA is to encourage and promote education in the private secondary education sector. It also ensures that the infrastructure standard of private secondary schools is maintained, as these schools are grant-aided. Therefore, private and public secondary

school teachers' salaries, conditions of service and grading structures are decided by the PRB. The 2008 report suggested that as from 1st July 2010 an Educators' Licence should be a requirement for the post of teacher in secondary schools. The teachers can still enrol for a PGCE after completion of the Educator's Licence. Teachers who enrol for a PGCE after completing the Educator's Licence are granted exemption from two core PGCE modules.

Currently all professional development programmes which integrate basic classroom practical skills, known as teaching practice in Mauritius, are delivered mainly by the MIE. The other PD providers have no "teaching practice component" in their programmes. These courses tend to be more academic. Examples of such courses are MSc Educational Administration and Technology, MA in Education Leadership and Management and MBA Educational Leadership. Teachers who fail to secure a seat at the MIE tend to go for these professional development courses. There is an absence of standardisation with regard to the teacher-training curriculum among the PD providers, which as described earlier, are diverse, thus making presently available PD programmes more challenging (Mushayikwa, 2013).

In 2009, the MIE resumed its in-service training courses after school hours for secondary school teachers. In-service training is delivered in part-time mode to teachers already in service. Anyone with a degree from a recognised university can join the teaching profession, and may enrol for a PGCE course to acquire the required pedagogical skills. Should they want to proceed further, they can opt for a Master in Education programme at the MIE.

Pre-service training is for those who aspire to be teachers. They can enrol for a Teaching Diploma secondary or a Bachelor of Education programme. Pre-service courses are delivered in full-time mode. After the course completion, there is no guarantee that the aspirant teacher will get a job. He or she has to wait until there is a vacancy in a secondary school, compared to primary school teachers, where all the teachers who go through the pre-service training are guaranteed employment after successful completion of the course. The educational approaches regarding teacher education need to be changed drastically to prepare them to cater with students' work and life in the 21st century (Dede, Eisenkraft, Frumin & Hartley, 2016).

1.2.1 Rationale

Conceptualising teachers' development according to their beliefs about online professional development is a relatively new phenomenon in Mauritian teacher development. This study is beneficial to the Ministry of Education, the main stakeholder of the education sector in Mauritius. It also proves to be useful to providers of professional development programmes such as institutions or universities. Presently, in-service training courses are delivered after formal schooling hours. The courses start and finish later than before. Teachers reach their homes late, and thus may have less time for their families. With OPD teachers may have to alter the family life pattern to get access to PD programmes. After formal teaching time, teachers may feel tired and may be less keen to learn or participate in activities or discussions. There is a need for PD providers to choose the best strategy to deliver PD courses to meet the teacher's individual needs. If teachers' needs are met, their classroom practices and skills are likely to improve, thereby resulting in a positive impact on students' performance.

The government has provided all secondary schools in Mauritius with free internet connectivity; also, the Ministry of Education and Human Resources, Tertiary Education and Scientific Research announced the introduction of tablet computers in all secondary schools for students of Grades 10 and 11 in 2014. Students in these grades now do not have tablet computers as the distribution of tablet computers which was to happen yearly occurred only once in 2014 when the project was implemented. This was in line with the government vision of making Mauritius a "Cyber Island". But these students are no longer at school. To help in transforming Mauritius into a "Cyber Island", being the agents of change, teachers will have to use ICT in their classes and in their personal education. Therefore, teachers' beliefs about PD using online technology should be studied. Teachers will need to be trained through ICT, as many teachers have been raised and educated in the traditional way without ICT. Therefore, most teachers have not been prepared to deal with new challenges (Friesen & Clifford, 2003) such as moving from knowledge provider to facilitator. However, Richardson (1990) points out that teachers are dissatisfied with the currently available PD programmes. Furthermore, teachers have to update their skills and knowledge continuously. Since online learning has only recently been introduced in Mauritius, there are very few studies in this area. Moreover, most of the studies involve undergraduate and masters' degrees and are

concerned with e-learning adoption. This study focuses on teachers' beliefs about online learning in teacher professional development in the Mauritian context.

1.2.2 Context of the study

The study has been carried out in the Mauritian context where education has been free since 1977. The main institution which delivers teacher education programmes is the MIE, a parastatal institution, which provides both subject content knowledge and pedagogical skills to teachers. The objective is to improve teachers' practices which are directly related to students' learning outcomes. During the past few years more and more teachers have joined the teaching profession with only an academic degree in the subject matter. However, the MIE has limited capacity to register more teachers so that they can acquire pedagogical skills, even though this skill was not compulsory until 2016. Borko (2004) claims that besides the content knowledge, teachers need a rich and flexible knowledge of pedagogy to nurture students' conceptual understanding. As such they need the pedagogical competences which would help them find new means to present the content to the students. Moreover, the programmes are mostly delivered in face-to-face mode. Thus, to remedy to this situation, and to provide more teachers with the basic pedagogical skills, the MIE has started to deliver a PD course in blended mode. With the help of the Human Resource Development Council (HRDC), operating under the aegis of the Ministry of Education and Human Resources, Tertiary Education and Scientific Research, many practising degree holder teachers have been able to follow the Educator's License programme to foster basic skills in pedagogy. This in-service professional development programme further enhances their experiences and their teaching foundation. Hence, this foundation provides them with the means to continue to pave their way in the teaching profession as student needs and the labour market change.

As from 2014, the Ministry of Education and Human Resources, Tertiary Education and Scientific Research has introduced tablet PCs in all secondary schools in Mauritius and this distribution of tablet PCs is intended to happen yearly. Consequently, teachers will need to nurture another skill previously known as technological pedagogical content knowledge (TPCK), now called TPACK (Mishra & Koehler, 2006). It combines content knowledge (CK), technological knowledge (TK) and pedagogical knowledge (PK) together. It is the

knowledge teachers need for Information Communication and Technology (ICT) integration in teaching. PD courses will have to integrate TPACK so that teachers can gain the skills in using ICT devices in their classes. An initial training has already been done via face-to face mode in a workshop organised by the Ministry of Education and Human Resource in collaboration with the MIE. It is clear that if the training is not ongoing, it will not be useful for teachers.

The percentage pass rate of School Certificate (SC) for the Republic of Mauritius from 2005 to 2016 has been as follows. From 2005 to 2006 the pass rate was about 78%. It decreased by two percentage points between 2007 and 2008 and increased by one percentage point from 2009 to 2010. From 2011 to 2015, the pass rate has decreased by one percentage point yearly. The SC pass rate was about 72% from 2015 to 2016. For the Higher School Certificate (HSC), the pass rate was about 78% in 2005 and increased by one percentage points in 2006. In 2007, it decreased by two percentage points and then increased by one percentage point in 2008 and it remained stable up to 2010. From 2011 to 2012, the pass rate has increased by one percentage point, then decreased by two in 2013 and there was a further decreased of two percentage points in 2014. The HSC pass rate remained at about 75% up to 2016 (source: Mauritius Examinations Syndicate 2017).

Consequently, in any educational institution, effective teacher professional development is very important for educational improvements (Desimone, 2009). Therefore, teachers need to continuously upgrade their skills and knowledge (Yang & Liu, 2004) via professional development. Studies in USA have shown that the performance of students will not improve unless the quality of teaching improves (The Holmes Group, 1986). Quality of teachers and teaching quality can be attained through continuous teacher professional development (Seferoglu, 1996). Therefore, the objective of professional development must help teachers to be more competent, skilful, knowledgeable, expert and professional (Alberth, Mursalim, Siam, & Suardika, 2018). Curwood (2011) claims that the upgraded teachers' competence is expected to increase student learning and learning experiences. Lieberman and Miler (1992) maintain that the process of professional development should be ongoing and integrated in day-to-day teaching. On the other hand, Seferoglu (1996) claimed that teacher professional development courses were offered for the sake of formality as participants were not interested. Such PD programmes seem to be insufficient as well as

limit opportunities to stimulate changes in teachers' practices and student learning (Darling-Hammond et al., 2017).

In the study carried out by Seferoglu (1996) in Turkey, it was found that 93% of the respondents believed that they need PD opportunities to enhance their skills and knowledge. But the percentage of respondents who claimed that the PD they went through did not meet their needs was 80%. More recent study shows that conventional professional development is ineffective as teachers tend to have individual needs (McConnell et al., 2013). These findings confirm the assumption that professional development activities are not always effective. Furthermore, 94% of teachers who participated in Seferoglu's study indicated that opportunities to share ideas with other teachers should be provided, as interactions among teachers, were important for their professional development. Regular social and professional collegial interactions among teachers are crucial so that the effects of PD increase (Penuel, Sun, Frank, & Gallagher, 2012).

1.3 Online professional development

Ideas and strategies implemented in developed countries will probably be adapted to the local context of a developing country such as Mauritius. Online professional development may be considered as one such strategy for effective and efficient teacher development. Internet has revolutionised education both locally and internationally. Now teachers can access and participate in professional development activities remotely. For example, the MIE is offering blended learning courses for teachers. The number of internet subscribers in Mauritius has increased, especially broadband subscribers to 54 internet subscriptions per 100 inhabitants. In addition, the percentage of primary and secondary schools having internet access is 95% and 100% respectively. The percentage of schools having internet connection for students in primary and secondary schools is 35% and 94% respectively. Moreover, 45% of the secondary schools have a web site (Statistics Mauritius, 2017).

In 2017 the Mauritius Telecom, which is the major provider of internet access across Mauritius, implemented the fibre-to-home project. Therefore, the speed of interconnectivity has increased to a minimum of 10 megabits per second, thus increasing in the speed of global communication and data transfer. There are ongoing initiatives to increase internet access

across Mauritius. The number of internet subscribers using mobile devices was 282 400 in 2012; this number has increased over the years and reached 650 800 subscribers in 2016, representing an increase of about 130% during these four years. For fixed line, it was 140 800 subscribers in 2012 and has increased by 51% to reach 212 600 in 2016. There were 423 200 broadband internet subscribers in 2012 and this has increased by 104% to 863 400 subscribers in 2016 (source: Statistics Mauritius, 2017).

The government, with the collaboration of the private sector, is planning to install free Wi-Fi spots in different parts in Mauritius with the objective of providing internet access everywhere. The internet has removed the barriers of distance and time in the learning environment. ICT has the ability to reduce the geographical isolation effects (Ami-Narh & Williams, 2012). So teachers now have access to global resources locally. They can download information and current research papers, post views or comments between colleagues, participate in voice communication and videoconferencing and access a collection of facilities that help in their development. These facilities encourage collaboration among teachers and reduce professional isolation.

As a result, this innovation can reduce government cost in providing such internet services and also develop positive professional values (Herrington & Herrington, 2006). But a study by Schrum (1995) found that even though in-service teachers were very keen to use technology in their profession, weak technical support, lack of access to it and limited financial resources reduced educators' use of technology in their schools. Interestingly, findings from Speak Up 2012 survey, "From Chalkboards to Tablets: The Digital Conversion of the K-12 Classroom", reveal that during the period 2008 to 2013, there was a considerable increase regarding the number of teachers and principals who participated in online classes, virtual professional learning communities and webinars (Cavanagh, 2013). There has been an increase of 17% in the number of principals who support professional advancement through some types of social networking in USA (Vu, Cao, Vu & Cepero, 2014).

Even as early as 1997, Kennewell and Selwood (1997) indicated that using technology in teacher professional development plays a significant part in improving access to the entire forms of education. Teachers have the opportunity to get access to informal education through online learning in which they took part in self-directed professional development programmes (Alhabahba & Mahfoodh, 2016). Informal education is about

“using the internet outside formal educational settings” according to Eynon and Malmberg (2011, p. 585). Consequently, online learning needs to provide ongoing support above technical skills and pedagogical knowledge to effectively influence teachers’ classroom practices and professional development (Al-Musawi, 2007; Ertmer & Hruskocy, 1999). Thus, teachers need to engage in online learning; so they must follow self-directed PD programmes as ongoing assistance may be absent. Moreover, self-directed learning enables teachers to be involved in numerous areas of learning in relation to their fields of interest (Fraser-Seeto, Howard, & Woodcock, 2015). Ultimately, the internet has enabled teachers’ professional learning to shift from a face-to-face approach to an online approach, as it offers the opportunities such as anytime, self-generating, and on-demand learning (Simonson, Schlosser, Orellana, 2011).

1.4 Problem statement

The need for effective TPD courses is necessary to develop innovative and quality pedagogy. Teachers need to have access to TPD as and when required, and the PD programme must include practice, training and feedback and also provide adequate time and follow-up support. In Mauritius teachers’ professional development programmes are mainly organised by the MIE, the only teacher education institution, with limited capacity to cater for the growing number of students for the different subjects of the TPD programme. Often secondary school teachers have to wait for years before obtaining entry to teacher-training programmes such as B.Ed and PGCE, resulting in discouragement. Many institutions (local and overseas) have also been organising TPD through distance education, face-to-face and blended mode for the last few years. One of these is the Centre for Innovative Lifelong Learning (CILL) from the UOM, which offers a Master in Educational Technology through a blended mode of delivery. Only PGCE from the MIE is recognised by the local stakeholders as the trainer as the programme contains a professional practice component which allows the trainer to assess the teaching practice during the course. Therefore, teachers prefer to choose the MIE PD courses which may help them in their daily teaching activities.

According to existing literature, PD courses delivered in face-to-face, distance and blended mode often fail to address the complex and contextual needs of TPD (Anderson and Henderson, 2004; Brooks-Young, 2001; DeWert et al., 2003; Hawley & Valli, 1999). The

programme is a one-size-fits all content, even though teachers work in different contexts. To improve TPD programmes' effectiveness, the programmes should be adjusted according to participants' range of behaviours and beliefs (Borko, 2004; Desimone, 2009; Hunzicker, 2011; Lieberman & Pointer Mace, 2010; Vescio, Rossa, & Adams, 2008).

In Mauritius the main problem is that there is no follow-up after the course duration, to assess whether the trainees are implementing the new ideas and concepts in the right way. There is no sustainability of the best practices acquired during professional development courses. Therefore, most of them revert to the routine kind of teaching as before the training, that is, they continue using the talk and chalk method and mostly teacher-centred strategies, as no one comes to visit them, discuss with them and encourage them in their classroom situation. So a cultural change in the teaching profession is required to work in this new era demanding collaboration within and beyond the school boundaries, focusing on student learning and promoting continuous learning.

Education is moving from an information age to a social media age. Digital media literacy is becoming a fundamental skill in nearly all professions (New Media Consortium, 2010). Advanced technology and networking resources can increase teacher collaboration, simplify the creation of communities of practice and augment reflection on teaching practices (Barnett, 2002). Thus, there is a need for TPD that emphasises the use of these new technologies in teacher-training programmes. Teachers need to pursue ongoing professional development beside seminars, workshops and in-service training delivered by the schools or the Ministry of Education, to deliver high-quality teaching and learning. If this happens, it will result in innovative ways of engaging teachers more fully and meaningfully in professional development adapted to meet teachers' needs. Although many researchers have studied teachers' beliefs, few have studied teachers' beliefs in OPD. Moreover, little is known about designing and implementing OPD, and online programmes may have done little to remove teachers' doubt about PD programmes in online as well as face-to-face modes that they frequently consider inadequate. As we are moving towards online teacher-training programmes, it is vital to study teachers' beliefs about OPD programmes, as what teachers think and do is the replication of their beliefs (Johnson, 1994; Phipps, 2007). Teachers' prior interaction with web-based learning may affect their beliefs and future adoption (Kao & Tsai, 2009) of OPD. Additionally, we need to understand the opportunities and challenges

presented by an online PD. If there is a lack of opportunities for teachers to share their difficulties and success in OPD, it will still be difficult to develop professionally (Kafyulilo, 2014). If the OPD programme is not ongoing, not supportive and does not provide space for feedback for teachers, OPD will prove inadequate.

Wei, Hammond, Andree, Richardson, and Orphanos (2009) in their study show that implementing TPD effectively builds strong working relationships. Mizell (2007) emphasises that every teacher must participate actively in professional development. As mentioned by Wei, Hammond, Andree, Richardson and Orphanos (2009) delivering sustainable and intensive PD activities positively impacts on students' outcomes. The need for change in TPD, is seen not only in the current and not so relevant content or the way it is delivered, but in the challenge of reaching as many teachers as possible at their convenience. Given, the technological changes and the social spaces that have become so prominent in communication, it is necessary to home in on these technological advancements for the benefit of teacher education and teacher professional development. So to better help teachers in their daily work, we need to shift to OPD, which is on-going and readily available. Therefore, it is vital to explore teachers' beliefs about such an emerging system as it plays a significant role in shaping their instructional behaviours, and thus what students learn. We need to understand what factors influence their beliefs about OPD, and how such beliefs are constructed to be able to build a model that explains teachers' participation in OPD.

1.4.1 Purpose of the study

The purpose of this sequential exploratory mixed-methods study is to explore teachers' beliefs about online professional development as they engage or intend to engage in the online learning environment. Phase one of the study is a qualitative exploration of secondary school teachers' beliefs about OPD from data collected through focus group discussions. The generated findings informed the development of a survey instrument to collect data from a larger sample of secondary school teachers. The phase two of this study is a quantitative description of teachers' beliefs about OPD.

1.4.2 Research questions

The thesis attempts to address the research problem that is related to teachers' beliefs about online professional development as they engage or intend to engage in the online learning environment. The subsequent critical questions were addressed to guide the research:

1. What are the secondary school teachers' beliefs about OPD and why do they have such beliefs?
2. What are the facilitating and inhibiting factors that influence secondary school teachers' beliefs about OPD?
3. How are secondary school teachers' beliefs about OPD constructed?
4. What model can be developed to explain the participation of secondary school teachers in OPD?

1.5 Significance of the study

Teacher professional development is one of the major aspects of educational reform. Our educational system has to be aligned with the changing technological advancement. This requires reform of education and practice continuously. Hence, all teachers must engage in professional development activities. That is why new approaches to professional development need to be developed in order to provide teachers with the possibilities to engage in such activities. Therefore, this study explores teachers' understanding about online professional development, by examining their beliefs about online professional development and professional growth.

The way teachers teach is greatly influenced by their beliefs (Richards & Lockhart, 1994). What and how students learn is also influenced by these beliefs (Calderhead, 1996). The beliefs that teachers hold about their subject matter, teaching and learning process are significantly influenced by their prior learning experiences. These beliefs are inculcated in new teachers by past generation teachers as they are working in a self-perpetuating system. Thus, teachers have the tendency to teach their students the way they were taught themselves (Baylor & Ritchie, 2002; Lortie, 1975). Their experiences as students influence the way teachers teach today, as pointed out by Johnson (1994), that a person's education and

experience shape his or her beliefs. Strong beliefs about teaching and learning are well established by the time a student finishes schooling. Therefore, if we want to change an educational system and encourage teachers to adopt up-to-date and better practices, it is essential to understand the nature of teachers' beliefs about online professional development (Richards, Gallo, & Renandya, 2001). Thus, we can develop a new professional development approach to initiate changes in teachers' beliefs as their behavioural approach is affected by their beliefs.

Additionally, the setting chosen is one of its own such that the study seems likely to advance knowledge in the field of teacher education. The context is a small developing country where schooling is free. Teachers' participation in professional development activities is optional. Most secondary school teachers are untrained in terms of pedagogical skills as pre-service education was not compulsory before joining the teaching profession until the last PRB report 2016. Thus online professional development can extend learning opportunities that cannot be derived from face-to-face learning. Since our educational system is examination-oriented, it favours mostly formal learning. But now that information is freely available at the click of a button, informal learning needs to be given recognition as well. Both formal and informal activities are termed as professional development as these activities are designed for teachers' personal professional growth (Eze, Adu, & Ruramayi, 2013). That study has established how online professional development can be implemented so that teachers with diverse characteristics and learning styles can situate themselves. The flexibility in online teacher professional development allows teachers to benefit from learning styles that are adapted to their personalities, thus enhancing ownership in the learning process. Also, online teaching and new learning competencies are critical for the new generation of teachers (Barret et al., 2012). Furthermore, being a teacher, the general problem has an intrinsic importance as it affects education. OPD is an alternative solution to the problem of face-to-face PD as it encourages teachers to be active participants in their own learning, hence promoting a growth mind-set. Moreover, OPD is ongoing while practice, training, feedback and follow-up can be provided simultaneously.

1.6 An overview of the methodology

The research study intended to explore and offer an understanding of social reality by expanding knowledge in this area, and/or theory development (Fouché & De Vos, 2005b; Grinnell, 1993; Neuman, 2006). An exploratory sequential mixed-methods approach in which qualitative and quantitative phases occur one after the other (Delport and Fouché, 2011) has been adopted. Data was collected, analysed and mixed from the two research phases separately. This approach has provided opportunities to discover the meaning of teachers' beliefs about OPD and realities of why teachers have such beliefs about OPD in the research context. By using a combination of quantitative and qualitative approaches, this research may offer a better understanding of research problems and multifaceted phenomena than either approach on its own (Creswell & Plano Clark, 2007), as teachers' beliefs are viewed from multiple perspectives, thus providing a more complete understanding of teachers' beliefs about OPD. For exploring the phenomenon, a qualitative methodology was used in the first phase before using the quantitative approach (Delport and Fouché, 2011) in phase two. Qualitative research methodology is used to explore why and how a phenomenon occurs in order to describe the nature of an individual's experiences. Focus group discussions were used to explore how teachers perceive OPD, and to determine what facilitating and inhibiting factors influenced their beliefs. The findings were used to develop a survey instrument to collect data quantitatively in the second phase. The data was analysed and then mixed with the qualitative data to develop a model that can explain teachers' participation in OPD. in schools.

1.7 The delimitations of the study

Delimitation is defined as "how the study will be narrowed in scope" by Creswell (2009, p. 106). In this study, the researcher focused on secondary school teachers' beliefs to support teacher learning and classroom practices in an online PD environment and their relationship. This study did not explore teachers' beliefs regarding the actual use of online professional development system since no concrete online learning initiative has been implemented in teacher education in Mauritius. The findings of the study are restricted to 65 secondary school teachers currently employed in two of the 19 Confessional schools in Mauritius as teachers employed in Confessional schools are usually not transferred to

another school, compared to those employed by the state. A small sample is used; therefore, the findings may not be generalised to all teachers in Mauritius. Future research can include a larger number of participants in Mauritius or across a wider area.

1.8 Researcher's bias

The researcher teaches computer science/information technology in a Confessional school under the aegis of Service Diocésain de l'Éducation Catholique (SeDEC), formerly Bureau de l'Éducation Catholique (BEC). Before the study began the researcher was familiar with certain participants. The researcher has participated in workshops organised by BEC. Being employed by a Confessional school helps the researcher to gain access to the schools and the participants. To minimise bias, the researcher met a peer to discuss the data and the interpretation so that the participants' perspectives are bias-free. Probing questions were used to help in considering different points of view and explore all the possible meanings embedded in the data collected.

1.9 Definitions of key terms

The definitions that followed were used for the purpose of this study:

Asynchronous learning – Learning that happens at different times and learners may engage at their convenient time. Their peers and the facilitator or lecturer or trainer can connect at any time to view or access the learner's post (Abramson & Ellis, 2000).

Teacher professional development – A growth that occurs through the professional cycle of a teacher (Glatthorn, 1987, 1995), including formal and informal learning tasks that nurture teachers' knowledge, skills, expertise and other characteristics related to teachers' career growth used as a concept for TPD.

Online professional development – “Professional development based on electronic technologies increasingly refers to web-based, interactive experiences combining text, video and sound. It is often asynchronous, in that all participants do not have to be engaging in an experience at the same time (as is the case with email). Yet online teacher professional development (OTPD) also can be richly interactive, in that it can give participants multiple opportunities to reflect on issues, questions, or answers before responding online” (National Research Council, 2007, p. 4).

Beliefs – The concept of beliefs that will be used in this study is that beliefs refer to suppositions, commitments, and ideologies and do not require a truth condition (Savasci-Acikalin, 2009).

Teachers' beliefs – They represent a complex, interconnected system frequently consist of values, implicit theories and beliefs that the teachers assumes to be true and which are used as cognitive filters that analyse latest experiences and influence the thinking process and behaviour of teachers.

1.10 Overview of the thesis

This chapter has laid the thesis foundation. It presents the background and purpose of the research, problem statement and questions. The definitions of the terms were provided.

Chapter Two presents the review of the literature. It describes the evolution of teacher professional development. It also explores the professional development process and the need for effective professional development for teachers. It presents theoretical assumptions about the nature of teachers' beliefs about OPD and findings emerging from previous studies conducted by scholars.

Chapter Three focuses on the conceptual framework. Two models are used; “the Unified Theory of Acceptance and Use of Technology (UTAUT)” (Venkatesh et al., 2003, p. 426) and teacher learning. These two models combine to form a new conceptual framework to guide this study in exploring teachers' beliefs about online professional development.

Chapter Four focuses on the approach that was adopted to carried out this study including the methods used, research questions instruments, population, sampling, participants, data collection procedures, validation, pilot, limitations, ethics, data analysis methods, field work and summary.

Chapter Five is about the qualitative approach (phase 1). Part one deals with the research context and the sampling technique used to gather data. It also explains how the data was produced and gives a description of how the pilot study was done. Furthermore, it describes how ethics was considered during and after the production of data. It also explains how the data would be analysed and ends with the limitation of the qualitative approach. Part two provides the findings from this study together with figures and tables of research

results. The findings will be presented in two phases, as this study is 2-phase sequential. The first findings will be from the qualitative phase and the second is from the quantitative phase.

Chapter Six is about the quantitative approach (phase 2) of the study. Part one describes the sampling procedure, the instrument used and also provides a description of validity and reliability. It then sets down the analysis procedures and ends with the limitations of the quantitative approach. Part two deals with the analysis of data from phase 2. It also describes the analytical tools used for example SPSS and the techniques used for data analysis which are multiple linear regression. It also deals with the presentation of the results.

Chapter Seven engages with the findings and discussion of the findings with the literature.

Chapter Eight provides an overview of the study including a statement of the problem, further discussions and conclusions drawn from the findings, implications for practice and implications for future research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The earlier chapter presented the research topic, focusing on the reason for doing this research and the problem statement. It also described the purpose and objectives of the study and offered a brief description of the methodology used for data collection. In this chapter, the literature which offers a theoretical background to understanding and exploring issues such as teachers' professional development, online professional development and their beliefs about online professional development is discussed. The researcher's intention is to highlight the connection among teachers' beliefs, their professional development and their practices to enhance student learning. The implications of the literature for this study are considered throughout this chapter which is made up of five sections. **Section one** is an introduction to the chapter. **Section two** deals with teacher professional development and its evolution. **Section three** describes secondary school practitioners and their professional development. It also highlights the advantages and disadvantages of face-to-face professional development. **Section four** provides a brief overview of online professional development. The section also describes the existing models of online professional development and the benefits and barriers to online professional development. **Section five** gives a short explanation of teachers' beliefs. It also mentions the types of teachers' beliefs and how these influence teachers' learnings and work. **Section six** provides a description of teachers' beliefs about online professional development. **Section seven** is a synthesis of the chapter.

2.2 Teacher professional development

Teacher professional development came to be an important issue in the educational sector after the widespread educational reform in 1980 and 1990 (Little, 1993) and continues to be so (Fishman et al., 2013; Lieberman & Mace, 2008; Penuel et al., 2007). Interest in teacher professional development was enhanced by policies such as the debates about the reauthorisation of the Elementary and Secondary Education Act and No Child Left behind Act in the US (Darling-Hammond, 2010; Meister, 2010). For the success of an educational system, access to PD programmes which are effective and relevant to teachers' needs is

crucial (Baran & Cagiltay, 2006; Borko 2004; Desimone, 2009; Foster, Toma & Troske, 2013; Lauer et al., 2014). PD has moved from a traditional lecture style (book-centred), which is behaviouristic, to a more student-centred (constructivist) learning approach (Banegas et al., 2013; Sparks & Hirsh, 1997). For PD to be effective, PD programmes must have these characteristics: focus on the content, promote active learning, be coherent, expand over an adequate period of time, and allow collective participation of teachers (Desimone, (2009). Yet the main issue with many teacher professional development courses is that teachers are participating passively (Dede et al., 2009). In traditional teacher professional development programmes, the lecturer or the facilitator is the principal leader delivering knowledge which is not contextualised to a group of teachers, where there is little interaction between them. Therefore, opportunities to create significant knowledge need to be created.

2.2.1 Evolution of teacher professional development

To adapt to changes in teachers' work, professional status and development needs, professional development forms and models have evolved. Studying the history of professional development would help to better understand trends in current PD. In-service education or in-service training (called professional development in this study) is not an innovative idea. It started in about 1850 with the objective of improving teachers' deficiencies (Corey, 1957). During that period, many teachers were not trained and had little knowledge about their subjects (Richey, 1957). The teaching profession was viewed as labour who had to follow instructions and department rules designed by curriculum experts (Hargreaves, 2002). The teachers were treated as workers with basic technical competencies in a period called "pre-professional" (Clercq & Phiri, 2013). The programmes were developed to aid inexperienced teachers to get knowledge and skills (Corey, 1957; Richey, 1957). The training was based on the subject content and a small number of pedagogical competencies (Clercq & Phiri, 2013). There was little involvement of teachers in the department-driven in-service teacher professional development training (Reitzug, 2002).

The training programmes included more teaching methods and classroom management, later delivered in the form of lectures or inspirational speakers. Late in the 1930s, the training shifted to workshop methods (Corey, 1957). This led to a transition of beliefs towards training programmes which no longer attempted to correct teachers'

deficiencies, but to enable cooperative, problem-solving approaches to instruction (Corey, 1957). The programmes were designed with the objective of helping new teachers, reducing deficiencies, motivating teachers to acquire new knowledge and promoting collaboration among teachers.

From about 1960, society was affected by rapid means of travel and communication speed had increased (Moffitt, 1963). Films, tape recorders and television were included in teacher education in addition to workshops. Gaining more pedagogical skills in the 1970s was a must, as schools in Europe and USA were forced to provide education of better quality and equity mostly for students from underprivileged environments (Clercq & Phiri, 2013). So teachers needed to acquire pedagogical skills to be able to adapt the syllabi to their learners' context and constraints, and therefore became more than just technicians (Clercq & Phiri, 2013). Hargreaves (2002) concluded that this gives rise to an 'autonomous professional' era where teachers had more control over their work as mediators of learning. PD has moved beyond department-driven training to on-site teacher development, in-service workshops concentrating on adjusting absence of pedagogical knowledge and skills of teachers (Christie, Harley & Penny, 2004). Evidence from increasing research in developing countries has revealed that teacher education programmes delivered using a general structure (traditional approach), such as workshops, were ineffective (Avalos, Tellez & Navarro, 2010).

In 1980 the 'autonomous professional' era moved to a higher level, which was the 'collegial professional' era, when teachers were treated as high professionals. They could share and reflect on their own experiences and practices together, which would help them to grow and improve professionally (Hargreaves, 2002). Teachers needed pedagogical content knowledge (PCK) beyond mere content knowledge, claimed Shulman (1986). PCK would provide teachers with skills to interpret the subject content, find alternative methods to present the content and make it manageable to the learners. School-based teachers' development was more efficient than teachers' development which happened outside the classroom (outside the school context) claimed international research (McLaughlin & Talbert, 2006). Teachers would change their classroom practices following teacher development activity if it had positive effects in the classroom. Otherwise, teachers would stick to their traditional practices, whereas teacher development emphasises changing their beliefs and attitudes (Guskey, 2002). By taking part in professional learning communities,

teachers could collaborate on their work and reflect in a collegial environment (Dufour, Dufour & Eaker, 2008). PD is criticised by some researchers as being solely used to correct teachers' deficiencies and for being fragmented, misaligned and disconnected (Schlager & Fusco, 2003). For teacher development programmes to be successful, the school working environment should be collaborative, trustworthy and friendly (Haughley, Howard & Marshall, 1996). Moreover, professional development must be holistic and critical as teachers are accountable to the school management, the Ministry of Education, parents and any related stakeholders (Albers, Harste, & Vasquez, 2011; Laughter, 2016; Larson & Shannon, 2016; Maniates, 2016). For continuous learning, teachers are moving towards online resources (Andrade et al., 2011; Hylén, 2006) so that they can perform other activities. They can save time and money, as they will not have to travel to a physical institution.

2.2.2 Teacher behavioural change

A lot of teachers and the general public expect constancy and things with which they are familiar with in the educational sector but the world itself is changing; therefore education is also. Hoban (2002) has noted that teachers are unwilling to review their practices for different reasons stemming from the context and the society even though we are living in a changing society. The reasons include a predisposition to follow and teach as peers do, and external pressure for finishing the course in a short period of time, leaving no room for new ideas to emerge. Parents are another factor that influences change in education (Duke, 2004). They want their children to acquire the same type of experiences as they had when they were students, despite the fact that we are living in a constantly changing society.

The school's culture is a major factor that affects teacher behavioural change. Teachers are happy to preserve the usual and to keep on with the conformist approach of educating instead of accepting new paradigms and practices (Lortie, 1975). Elmore (2006) describes this situation as "the deeply rooted beliefs, structures, artefacts, and symbols of an increasingly dysfunctional and obsolete set of institutions" (p. xi). But teachers must change their traditional approaches, that is, their classroom practices, to affect students' learning. Thus, professional development activities need to be provided to assist teachers to enact change in their practices. But many professional development activities fail to take into consideration the process of teacher behavioural change (Guskey, 2002). Professional

development activities are often designed to begin change in teachers' beliefs, perceptions and attitudes. But if the change agents in education are dominated by the central authority, the teachers and schools make little, if any, contributions to decision making for professional development and education reform (Guskey, 1986). According to Guskey (1986), the centralised control in professional development must be shifted to the school and the teachers. Then the school and teachers can become the unit of change, therefore giving voice to them in decision making for the reform. In this way, they are associates in professional development design, goal setting and assessment.

There are also other factors that force schools and educators to change, which include society's and government's expectations as well as the public which carefully analyses the outcomes. The need for professional development is often associated with deficiencies in teacher knowledge and practices. It is also viewed by some people outside the educational field as an indication that teachers are not doing their work properly. Therefore, to respond to these negative opinions on teacher knowledge and practices, professional development is offered, but in one session only. But evidence about the limitations and ineffectiveness of one-off professional development approach has been provided by many researchers (Fullan, Hill & Crévola, 2006; Lovitt & Clarke, 1988) that is professional development which is delivered only once. Teachers need effective professional development, which is long-term process to improve their teaching skills (Fullan, Hill & Crévola, 2006). The application of new practices changes teachers' beliefs and attitudes when students' achievements improve. Consequently, teachers will be motivated to use recently learnt practices. Jackson (1974) describes professional development as the process through which practising teachers fulfil their professional growth rather than those who need professional development due to knowledge and practice deficiencies. We need to move beyond teachers' craft knowledge so that we can unify theory and practice (Stones, 1989). Furthermore, professional development has shifted from content knowledge to PCK which is about the teaching process as well as the content knowledge. So the past practices would not offer the knowledge and skills needed in this new age as shown in Shulman's (1986) study. Therefore, for teachers to acquire such skills and knowledge, PD must be content-focused, active, collective, coherent and sustainable (Little, 2006). There are also other factors that force schools and educators to change, which include society's and government's expectations as well as the public which

carefully analyses the outcomes. In practice, it is more complex as theory alone is not enough (Cohen & Hill, 1998).

2.2.3 Elements of professional development

Teacher PD is a key component in nearly every proposal for educational improvement reform. As Fishman and colleagues (2003) noted, professional development should bring changes in teachers' knowledge, beliefs, attitudes and behaviours, as these changes are directly linked to classroom practice, which impacts on students' learning experiences. The leading researchers in the field of teacher development have not provided a precise definition of what teacher development or professional development meant to them (Darling-Hammond, 1994b; Fullan & Hargreaves, 1992; Leithwood, 1992). Some researchers in the field claimed that PD increases knowledge and develops new instructional practices (Gore & Ladwig, 2006), and it enhances student learning (Alberta Education, 2010; Blank, de las Alas & Smith, 2008; Borko, 2004; Garet, Porter, Desimone, Birman, & Yoon, 2001). Bell and Gilbert (1994) have provided a description rather than a definition of teacher development as follows: "Teacher development can be viewed as teachers learning, rather than as others getting teachers to change. While learning, the teachers were developing their beliefs and ideas; developing their classroom practice, and attending to their feelings associated with changing" (p. 493). They have identified and classified the development in three main categories, personal, professional and social, that should occur simultaneously for development to happen. Bell and Gilbert (1994) maintain that practising and evaluating new theoretical ideas and teaching suggestions collaboratively over a period of time is important for teacher development. They state that critically reflecting and providing feedback are key factors of teacher development. These factors were later broadened by Lyndon and King (2009) to encompass the fact that PD should focus on curriculum needs, connected to the goal of the school to be characterised as effective PD. Their description tends to be narrow and restricted as it did not make provision for teacher development occurring in a shorter duration of time or happening incidentally or accidentally (Evans, 2002).

Fullan (1991) candidly stated that "nothing has promised so much and has been so frustratingly wasteful as the thousands of workshops and conferences that led to no

significant change in practice” (p. 315). Such a finding, while not conclusive, provides support for adopting new ways of teacher development. It has also been noted that PD in the form of the workshop presentation style (Rebora, 2008) and teacher training and development using traditional approaches have proved to be inadequate as teachers’ needs are not met (Schleicher, 2011). Such perspectives indicate that traditional approaches are the major mode of PD delivery and are not meeting the needs of the individual teacher. Rather than providing concrete, specific and practical ideas directly related to the running of their daily classroom practices (Fullan & Miles, 1992), PD activities focus on the content matter presented in a general teacher education structure. As suggested by Guskey (1986), this ineffectiveness of PD is further enhanced when these important two elements are not considered: 1) motivation of teachers to participate in PD; and 2) the way change in teacher behaviour happens. Nevertheless, there are undoubtedly other elements to be taken into account while providing PD programmes. Some of these elements are effective feedback, cooperation, collegiality, practice-oriented staff development, a culture of shared beliefs and relationships (Lumpe, 2007). To continue wasting money and time in providing inefficient professional development for teachers limits investment in more promising modes of delivery. PD programmes tend to remain ineffective as long as these issues remain unaddressed, mostly the two crucial ones mentioned above. Fullan (2006) has also stated that unless PD content “motivates people to put in the effort – individually and collectively – that is necessary to get results, improvement is not possible” (p. 8).

The concept of teacher PD in this study is defined as a growth that occurs through the professional cycle of a teacher (Glatthorn, 1987, 1995), which includes formal and informal learning activities that nurture teachers’ skill, expertise, knowledge and other characteristics related to teachers’ career growth. Research has shown that PD should be continuous, sustainable, intensive and supported by modelling and coaching. In this way, teachers will be able to see and share their own work reflectively and collaboratively. It is also believed that PD of teachers should be integrated into the curriculum, classroom and school (Fullan & Hargreaves, 2002; Killion, 2007; Killion & Williams, 2009). Fostering an understanding and stimulating setting for evaluating new concepts and new teaching strategy, to change practices (Killion & Williams, 2009) can be more appropriate to meet individual teacher’s needs than a one-fit-all PD programme. New technologies appear to have the

possibility to create and implement sustainable, complex and meaningful professional learning environment in schools (Huber, 2010) for teachers.

2.3 Professional development of secondary school teachers

2.3.1 Professional development process

TPD was seen as a process for “the acquisition of knowledge, experience and skills, and the development of personal qualities for the execution of professional and academic duties that enable the individual member to contribute efficiently to the institution and the community” (Bertani and Tafel, 1992, p. 12). Three features of professional development recognised as essential by these authors are experience, knowledge and skills. Knowledge and skills imply not only familiarity with techniques that then are used mechanically, but also the acquisition of routines which every teacher needs to perform his or her tasks with less time and energy. It is a set of techniques and strategies that a teacher chooses and shapes according to a given situation (Liakopoulou, 2011). Furthermore, they added that for professional development to take place, teachers must emotionally engage their personal qualities or beliefs in their profession. But as PD is goal-oriented (directed process), there is an interaction between the school’s needs and the teacher’s professional development needs (Mushayikwa, 2013). Normally, the school should provide the required professional development activities so that teachers can adjust or change their practices regarding the changing needs of their students and keep updating their development (Mushayikwa, 2013). However, in Mauritius, this support is not forthcoming. This is mainly because education is free in Mauritius. Some schools are owned by the state and others are grant-aided and these schools have no funds to provide this support to teachers. Therefore, teachers must invest in their own PD for the benefit of the students. Thus, in Mauritius, such PD activities are provided solely by parastatal institutions such as the MIE among others. Most of the courses are offered in face-to-face mode which are teacher centred, which does not encourage self-directed learning. But Bouchard (1996) argued that self-directed professional development would solve the problem of ineffective PD that does not meet teacher’s specific requirements. Beavers (2009) agrees with this interpretation while stresses the point that teachers must be part of their own PD.

Workshops and training must not be the sole components of professional development (Kafyulilo, 2014). Training sessions, seminars and workshops should be followed with continuous support from the stakeholders for PD programmes to be effective (Borko, 2004; Lumpe, 2007). Kafyulilo (2014) added that in practice it is difficult for organisers of workshops and training sessions to offer follow-up workshops and consultations to teachers attending these programmes. On the contrary, Lumpe (2007) and Borko et al. (2002) claimed that workshops and training are inadequate as long as support is not provided afterwards. To cater for this lack of follow-up for an effective PD, Lumpe (2007) suggests that teachers must participate in a professional learning community, for example, peer coaching, collaborative analysis of students learning, critical friends group and lesson study. Having the chance to talk over and observe each other's classroom practices and analyse their data, helps teachers to implement changes more efficiently (Borko, Jacobs, Eiteljorg & Pittman, 2008; Cerbin & Kopp, 2006). Inger (1993) argued that teachers have worked in isolation for too long, making it difficult to change their traditional tendencies. Face-to-face PD has largely dominated in the past years in terms of teachers' PD (Boehm et al., 2012). It continues to be an important means of implementing teachers' PD (Davis, 2011). Face-to-face PD is a concept where teachers meet in a central physical place to attend workshops or conferences for a specified period of time, spreading over one to a couple of hours, days, weeks or months (Hoban & Erickson, 2004; Lydon & King, 2009; Berger, Eylon & Bagno, 2008). Face-to-face meetings in many cases have proved to be inefficient to satisfy teachers' needs and bring changes in classroom practices or behaviours (Hill, 2007; McConnell et al., 2013). According to Gulamhussein (2013), PD must be sufficiently long and ongoing as well as related to teachers' needs to bring changes.

2.3.2 Effective teacher professional development

Before professional development was offered to overcome the apparent lack of knowledge and practices, the objective was only to fix this apparent deficit in professional development. The main goal of PD was to support teacher pedagogy and in turn, student learning outcomes; therefore all educational reform plans must consist of professional development. Guskey and Huberman (1995) indicate that the current and ongoing importance of professional development originates from "the growing recognition of

education as a dynamic, professional field” (p. 1). Sometimes teachers are required to engage in professional development as they want to influence the students positively, mostly after their schooling. Teachers consider that professional development has the capability to help them in enhancing the teaching and learning process. What constitutes effective teaching must be the foundation of professional development. But Fishman et al. (2003) claim that teacher learning can be very difficult to measure in professional development. Since there are other perspectives regarding teaching, there are also other views concerning teacher professional development. Hoban (2002) indicates that “if teaching is conceived to be a labour to be mastered, then it is logical to assume that teacher learning involves attending workshops to gain additional knowledge and skills to increase mastery” (p. 11). Day (1999) describes this interpretation of professional development of teachers as ‘additive’; for instance it denotes the addition of new strategies to existing ones. This method of professional development is described as a “single-loop” (p. 19) by Argyris and Schön (1974), where designed actions that fulfil instant challenges are used to maintain consistency. Whenever a new challenge arises, a solution or proposed action is added to the existing ones to cope with that challenge and maintain consistency. This assumes that change occurs naturally after obtaining new information or curriculum materials from teacher professional development activities. Being components of teacher cognition, teachers’ attitudes, beliefs and knowledge show a strong relationship to teachers’ classroom practices, thus, effective professional development has the potential to nurture changes in these components as stated by Richardson (1996). A more diverse learning setting for both existing and future teachers was proposed by Putnam and Borko (2000), which should include demonstration, theory, feedback and practice to be effective (Joyce & Showers, 1980). Later on, they added that to increase greatly teachers’ learning and use of strategy we must provide coaching, study team and peer support (Joyce & Showers, 1988).

2.3.3 Advantages of teacher professional development

Due to the complexity of the teaching profession (Ingersoll, 2003), it takes years for new teachers to gain the required skills to be effective in their roles. So teachers must experience effective PD to improve their skills. Even experienced teachers need PD as there are changes in the subject content, new methods of instruction, technological advances,

procedures and students' learning needs. Strong, Fletcher and Villar (2004) claimed that new teachers who received intensive mentoring had a significant effect on students' achievement after two years. Teachers continue to favour face-to-face PD programmes (Donavant, 2009) and participants tend to express a high level of motivation towards face-to-face PD (Mentzer, Cryan & Teclehaimanot, 2007). Pre-service teachers added that the interactions with in-service teachers better prepared them for real classroom settings. Therefore, collaboration among teachers should be encouraged. This collaboration promotes school change that extends beyond individual classrooms (McLaughlin & Talbert, 2001). Teachers also prefer traditional face-to-face PD, as they use their working time rather than their personal time to gain PD. As learning styles influence teachers' attitudes towards PD programmes (Chen & Chiou, 2012), teachers who have a preference for social and applied learning approaches (Ramage, 2002) would most probably better perform in face-to-face courses (Stern, 2004). Well-defined learning objectives which are related to teachers' needs in a collaborative and active environment have proved to have a constructive effect on teachers (Lauer et al., 2014) through short-duration PD programmes. PD delivered in a school context helps teachers analyse student achievement and identify their learning difficulties and develop solutions to address the students' needs during the school year. The teachers become more skilful, which can help to reduce or eliminate performance variations. Thus teachers develop trust, which according to Wilcox, Lawson, and Angelis (2017) is essential for "developing individuals' capacities to innovate and improve" (p. 19). A trusting environment provides space for reflection on teachers' own practices (Lieberman & Wood, 2002). Moreover, TPD has the possibility to transform teaching practices and student learning if it is sustained and intense (Desimone et al, 2002; Weiss & Pasley, 2006). On the other hand, for those who are independent learners, online learning would be more appropriate (Ramage, 2002).

2.3.4 Disadvantages of teacher professional development

Traditional face-to-face PD, also known as "one-shot workshop", has failed to influence teachers' classroom practices and pedagogies (Guskey, 2002; Kesson & Henderson, 2010). There is a deficiency in follow-up and assistance and the professional development is therefore perceived as fragmented (Borko, 2004). These professional development programmes are often offered for a short duration. These short PD courses provide limited

opportunities for teachers' growth as they are often delivered by an outside resource person (Owston, Sinclair & Wideman, 2008) who probably lacks knowledge about the school context and the classroom realities (Baran & Calgitay, 2006). As a result, participants develop negative feelings towards the workshop session (Patton, Parker & Neutzling, 2012). Thus, the workshop remains theory-driven and unconnected to teachers' everyday working activities. Professional development offered in a concentrated forum is not enough for teachers (Hinson, LaPrairie & Heroman, 2006). Furthermore, teachers have to move to training sites, thereby wasting time and money on travelling. In big countries, rural teachers tend to have limited contact to resources such as experienced teachers (Cady & Rearden 2009; Sawchuk 2009; White & Kline 2012). In Mauritius, this is not the case as it is small; teachers tend to have access to almost the same resources across the country. Teachers living in rural areas can work in schools found in urban areas and vice versa. But as seats are limited in face-to-face training, only a fraction can participate in the training sessions (Boehm et al., 2012; de Mesquita, Dean, & Young, 2010), and this can give rise to discouragement. Additionally, traditional face-to-face training is firmly restricted by time (Lawless & Pellegrino, 2007) and space (Smith, Wilson, & Corbett, 2009). The lack of effectiveness is due to the fact that such training is not sustained and intensive (McConnell, Parker, Eberhardt, Koehler, & Lundeberg, 2013; Wayne, Yoon, Zhu, Cronen, & Garet, 2008). Consequently, the interaction between the trainer and the participants stops after the workshop sessions (Alberth, Mursalim, Siam, & Suardika, 2018). However, the content which was intended to change teaching practices is not necessarily related to the needs of teachers, as the participating teachers come from different contexts and subject areas (Smith et al., 2009). More recently, researchers found that traditional forms of teacher training alone were inefficient in promoting teaching practice, and thus student learning (Darling-Hammond et al., 2017). Therefore, other alternatives for providing professional development need to be implemented which teachers can access throughout their professional growth. This alternative can be in the form of continuous PD through which teachers can continuously update their PCK. As teachers claim that knowledge acquired during teacher-training sessions does not help them to handle uncertainty, complexity and instability that arise in practical situations (Oosterheert, 2001). Resulting in the tendency for teachers to imitate

their teachers when they were students since that is the way they have been taught as Korthagen and Kessels (1999).

2.3.5 Continuous professional development (CPD)

With the ever-changing perspectives in education, society and students, teachers have to continuously update their skills and knowledge. Teachers must engage in continuous professional development because, as claimed by Yoon et al. (2007), it is more often the case that short and one-shot workshops do not transform teachers' practice or students' performance. As pointed out by Day and Sachs (2004), teachers in most Western countries are expected to continue their learning after their initial course to cope with the changing world during their professional career. In the US, it is compulsory for teachers to complete their continuous PD to be able to renew their licences (Jaquith, Mindich, Wei, & Darling-Hammond, 2010). In Europe strategies regarding PD engagement differ (De Vries, Jansen, & Van de Grift, 2013). Continuous PD is optional but is related to teachers' career advancement and salary increases in countries such as Poland, Portugal, Slovakia, Slovenia, and Spain (De Vries, Jansen, & Van de Grift, 2013). In Mauritius, the case appears to be the same and teachers are free to engage in PD or not. However, lack of further training may have an impact on future promotion. In other countries such as France, Iceland, Sweden and the Netherlands, participation in continuous CPD is part of teachers' duty and not related to promotion or salary increases, (Scheerens, 2010).

The national policies in Europe regarding education, teacher education and continuous professional development are reinforced by a vision of a "knowledge-driven" society where lifelong learning is an important factor (Armour & Makopoulou, 2012). According to this vision, citizens and employees must develop capacities in order for them to be independent and autonomous learners who are innovative, creative, critical thinking, take risks and are collaborative (August et al., 2006; European Commission, 2008). Schools and teachers have a crucial role in helping to attain this vision. Therefore, effective and appropriate lifelong professional development is a major ingredient for teachers to be lifelong learners (Armour & Makopoulou, 2012). Dede (2016) claims that PD is often superficial in terms of content and duration. In England, the government has given priority to personalised ongoing and tailored CPD as opportunities for every teacher (Day, 2002). In

the UK, the government has preferred to allow schools the responsibility to deal with their teachers and their professional development (Armour & Makopoulou, 2012). However, the argument has been made that not every school possesses the ability and resources to become such a learning organisation that have the potential to sustain and prolong teachers' professional development (Pedder, James & Macbeath, 2005). This shift in providing professional development for teachers is reinforced by Timperley (2008), who states that "professional learning is strongly shaped by the context in which a teacher practices" (p. 6). The context is the classroom which is influenced by the school culture, the community, and the social environment of the school (Timperley, 2008).

It was observed that Physical Education teachers' experiences with CPD lack coherence, relevance, challenge and progression in Armour and Yelling's studies (2004a, 2004b, 2007). These teachers hold robust beliefs about the value of collaborative learning, but are conscious that this method of informal learning is not regarded as CPD by their schools. On the contrary, if teachers leave their students to attend official CPD programmes, these are recognised as CPD, although these programmes can finally be ineffective (Armour & Yelling, 2007).

CPD that is normally classified in nine categories: training, award-bearing, deficit, cascade, standards-based, coaching/mentoring, community of practice, action research; and transformative. All these models can be integrated in OPD. More recent research values professional development that is active, practical, situated, collaborative, continuous, capacity-building, reflective, innovative and evolving, and promoting autonomous learners (Makopoulou & Armour, 2011a, 2011b).

2.3.6 Impact of professional development on students' learning

We are living in a society in which rapid social, economic, technological and cultural change is driving the way young people are being prepared to be effective citizens. Students need education to be armed with the necessary skills to learn, to transfer learning and to live in this rapidly changing world. Teachers play a significant role in this process and that is why professional development is needed to improve teachers' practices. According to Yoon and friends (2007), professional development affects students' learning outcomes through three levels. In the first level, teachers acquire knowledge and skills through PD which

includes theory of action, planning, design and implementation which are of high quality. Secondly, classroom teaching is improved by better knowledge and skills as teachers must possess motivation, beliefs and skill to implement PD in classroom instructions. Lastly, improving teaching raises students' learning outcomes which can be sustained through ongoing collaboration among schools and follow-up by the trainers. Therefore, all the phases must be present and strong to increase students' performance as expected. But Timperley (2008) argues that trying to link teacher learning activity to student learning outcomes is more complex than teacher professional learning itself. Literature has shown that a lot of research needs to be done in this direction even though significant progress has been made (Desimone, 2009), even though Blank and Alas (2009) have claimed that teachers' teaching practices are influenced by knowledge gain through PD. Government policy is an important element, as in Mauritius, where the government through the Ministry of Education emphasises students' outcomes in all educational reforms, and puts less emphasis on teacher education. The objectives of the reforms were to reduce students' dropout and increase students' numeracy and literacy.

These educational reforms put teachers in situations for which they were not adequately prepared, and continuing to provide one-day workshops for teachers which have been shown in literature to be ineffective. But in fact, the quality of teaching is an essential factor that may affect the students' outcomes. Darling-Hammond (2006) concludes from a survey carried out in the USA that teacher preparation and certification significantly correlate with student learning outcomes. Therefore, this statement shows the importance of quality teaching in improving students' learning outcomes. In China, according to Chu et al. (2015) teachers with high professional standing affect rural students' achievement more positively than teachers of lower rank. But there may be many ways to improve quality teaching, for example by increasing in teachers' salaries (Chu et al., 2015) or appropriate policy decisions as regards professional development of teachers, among other strategies. Recently, the government of China has invested greatly in teacher PD and the PD programmes focus on ethics in teaching (10%), subject-specific knowledge (40%), and pedagogical practices (50%). This initiative was to improve teaching quality. Darling-Hammond (2012) defines teaching quality as "instruction that enables a wide range of students to learn" (p. i). But there is still insufficient evidence of the effectiveness of these

programmes whether in China or other developing countries (Government of Chile, 2003; Government of India, 2013; Yan, Wie & Li, 2013).

In the US, the priority of professional development is to improve teacher quality, which necessitates teachers holding deep knowledge of the subject matter and the pedagogy to teach the subject more effectively (Blank & de las Alas, 2010). Teacher quality is about improving teaching in the classroom, teacher preparation and ongoing professional development. In Mauritius, for example, teacher preparation is mostly for those who have just a higher academic qualification. Professional development is neither ongoing nor funded like in some cases in the US. Regarding what Yoon and friends (2007) highlighted about the phases of an effective professional development, it seems that these are weak or missing in Mauritius. Blank and de las Alas (2010) point out that research-based programme designs of professional development with evidence of their effectiveness are in great demand in the US to enable the design, selection and implementation of effective PD for teachers. Wayne and Youngs (2003) found in their study that teacher characteristics, knowledge and classroom practices have very low correlations to student achievement. As the MIE is the main provider of teacher professional development in Mauritius, it is difficult to produce what Blank et al. called teacher quality, due to lack of resources. Moreover, it is almost impossible for schools to organise professional development activities according to their teachers' needs due to lack of funds. Nevertheless, the pass rate at School Certificate and Higher School Certificate is above 70% as shown in section 1.2.2 in Chapter One. But still, "we have no reliable, valid and scientifically defensible data" (Guskey & Yoon, 2009, p. 498) to sustain declarations about the effectiveness and ineffectiveness of CPD approaches. Despite the important engagement and interactions of the face-to-face approach, professionals are gradually moving towards online learning to be brought up to date in their respective fields (Bolt, 2012; Laurillard & Masterman, 2010) which can be an alternative to improve students' performance, as the students are digital natives.

2.3.7 Impact of private tutoring on teacher professional development

In Mauritius, private tuition is a widespread phenomenon, as in many developing countries. It is usually done informally. Teachers give private tutoring to increase their income and also to help students in their academic performance as the contact hours are

increased and the student gets individual attention normally. Private tutoring can be personal, in large classes or in small groups. However, private tuition is becoming part of the educational system, where teachers are no longer the sole providers of private tutoring. Other professionals like accountants, among others, give private tuition even though they have high incomes. It is also known as “shadow education” as it imitates the content of regular schooling. As the school curriculum is examination-based, students and parents believe that with the high school population, the schools do not provide the required knowledge for the examinations, and thus opt for private tutoring to enhance students’ learning outcomes (Elbadawy, Assaad, Ahlburg & Levison, 2007). But as teachers invest their time after school hours to provide private tutoring to increase their revenue (Loveluck, 2012), they tend to perform weakly at school. As a result, no time is available for teachers to invest in professional development.

Four basic scenarios regarding private tutoring happening across the world are described next (Bray & Kwo, 2014). In some countries, like Bhutan, Japan, the Republic of Korea and Taiwan, providing private tuition is prohibited, and in others, it is discouraged by the government. In some countries, like Malaysia, Singapore and Vietnam, private tutoring can be provided if permission is granted. Finally, in countries like Hong Kong, Macao, Philippines, Thailand, including Mauritius, there is a laissez-faire approach, leaving the decision to the teachers and their clients. Private supplementary tutoring is also being provided through the internet (Bray, 2009, 2011; Bray & Lykins, 2012). Recently in Mauritius, the government has implemented a project with the objective of providing free online private tutoring to secondary school students.

2.4 Teacher professional development in the online environment

2.4.1 Teacher education in online learning mode

According to Vrasidas and Glass (2004), professional development can be in various forms: collective or individual development; continuing education; pre- and in-service education; group work; team curriculum development; peer collaboration; and peer support. Online learning is emerging rapidly as a means for professional development in various sectors such as education, industry and business. The teaching profession is facing the question of whether professional development can occur in an online environment (Vrasidas

& Glass, 2004). Also, teachers, of whom many are women, claim the need for professional development programmes which are delivered anytime and anywhere (Vrasidas & Glass, 2004). In Mauritius, according to statistics, there are more women than men in the teaching profession (out of 8,222 teachers in secondary schools in Mauritius 39% are males and 61% are females) (Statistics Mauritius, 2017).

Vrasidas and Glass (2004) claimed that there was a shortage of research providing grounded theoretical frameworks to guide and assess the development of an online learning environment (e-learning). OPD can be conceptualised as the delivery of teacher learning resources partly or completely on the internet at times convenient to the user, and must be ongoing, timely and relevant to the needs of the profession. Learning in an online environment is gaining popularity, and is becoming a substitution to traditional professional development programmes and in higher education (Tallent-Runnels, Thomas, Lam, Cooper, Ahern, Shaw, & Liu, 2006). The participants and providers of professional development preferred an online learning model to a face-to-face model (Tallent-Runnels et al., 2006). Many researchers (Ebert-May et al., 2011; Löfström & Nevgi, 2008; Rienties, Brouwer, Lygo-Baker, & Townsend, 2011; Rienties et al., 2012) stress the point that higher education institutions in Europe and the US must offer appropriate PD, staff support and training for academics to increase their consciousness concerning the complexity of the interaction between technology, pedagogy and the cognitive content in their fields. But regarding the best online practices, the evidence is sparse, according to Ketelhut et al. (2006) and Dede (2006). Brooks and Gibson (2012) identified different features of effective OPD. OPD allows teachers to take part in more personalised, relevant, meaningful and engaging PD as they have the opportunities to 1) choose their learning experiences; 2) take advantage of the flexibility provided through the usage of technology (e.g. learn at their own pace); 3) tailor the experience (e.g. connecting with particular peer and researcher); and 4) provide space for reflection. For effective professional development, online spaces must: (1) inform practices; (2) have sustainability; (3) have willing participation; and (4) include interactivity and interaction that facilitates collaboration allowing sharing of multiple perspectives on a subject matter (Albers, Cho, et al., 2015). Further professional development occurs solely when teachers commit themselves by asking their own questions and studying issues of their individual choices (Peery, 2004). Teachers engaging in OPD are more motivated by intrinsic

factors including areas of concern, the usefulness of an experience, or the possibility to learn new things compared to extrinsic rewards as course credits (Lebec & Luft, 2007).

2.4.2 Models of online professional development

The use of OPD has increased widely over the past few years with a number of options which seem to be unlimited (Brown & Green, 2003; Lebec & Luft, 2007; Sherin & Van Es, 2005, 2009; Signer, 2008; Russell et al., 2009; Whitcomb, Borko & Liston, 2009) delivered in different formats; for example video-based and through the internet (Kao, Wu, & Tsai, 2011; Sherin & van Es, 2005; Stockero, 2008). This is because teachers' professional development is moving towards a more demand-driven model (Lim & Lee, 2014). The walls of the classroom and the home have extended through social media, clouds, podcasts, wikis and video conferences. The materials can be downloaded and studied at teachers' convenience (Boehm et al. 2012; Frazier & Boehm, 2012). Online professional development can be offered in different means such as distance learning using video conferencing, online asynchronous courses, removing the situation where all the participants should be available at the same time and self-paced online courses (Russell, Carey, Kleiman, & Venale, 2009).

There are different approaches of online teacher professional development activities, such as those that use critical friend group technique (Vo & Nguyen, 2010), online forums (Prestridge, 2010), online synchronous discussion (Chen, Chen & Tsai, 2009), project-based approach (Frey, 2009) and blended learning approach (Owston, Wideman, Murphy & Lupshenyuk, 2008). Additionally, OPD courses have emerged recently (Dede, 2006); consequently, teachers' beliefs about OPD should be explored so that teachers benefit greatly from this new way of professional learning. Moreover, Fullan (2006) predicted that for OPD programmes to have successful results, PD activities have to motivate participants to individually and collectively make efforts to participate in online teacher training for professional development. Thus, to increase PD programmes' effectiveness, the programmes should be adjusted according to participants' range of behaviours and beliefs (Borko, 2004; Desimone, 2009; Hunzicker, 2011; Lieberman & Pointer Mace, 2010; Vescio, Rossa, & Adams, 2008). Lebec and Luft (2007) have found that, when there are no extrinsic rewards such as credits, teachers are less motivated to take part in OPD.

For practising teachers, a blended mode is proposed where there is the component of face-to-face encounters with a facilitator and learning online both individually and in cluster meetings (Prestridge & Tondeur, 2015). Teachers perceive face-to-face meetings as essential. In 2014, Australia and the UK implemented a blended approach of professional development for teachers where they participated in an online course which was supported by an preliminary face-to-face training (Prestridge & Tondeur, 2015). More recently there has been a move to fully online course for teachers (Prestridge & Tondeur, 2015). The project was initiated in 2011, where teachers can collaborate through the PLANE (“Pathways for Learning, Anywhere, Anytime – a Network for Educators”) website (Maher, 2013). The teachers were expected to generate an e-portfolio and were provided accreditation upon completion (Prestridge & Tondeur, 2015). It is observed that real-time webinars enable teachers to engage in dialogue with colleagues worldwide. In Mauritius, professional development institutions have started with the blended mode. Perhaps in the near future, professional development programmes can be fully online.

2.4.3 Benefits of online professional development

According to Jackson (1999), traditional face-to-face approaches of TPD are not working effectively, as there is a lack of day-to-day support, programmes are not relevant to the context, and it is not flexible regarding the time schedule. Other researchers added that traditional PD courses often fail to address complex and contextual needs of teacher PD (Anderson & Henderson, 2004; Brooks-Young, 2001; DeWert et al., 2003; Hawley & Valli, 1999; McRae et al., 2001). As a result, in this Social Media Technology Age which is emerging, OPD may be able to satisfy teachers’ needs (Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009; Herrington, Herrington, Hoban, & Reid, 2009; Vrasidas & Glass, 2004). According to Whitehouse et al. (2006), online PD programmes are available to teachers at their work at their convenience and provide just-in-time assistance when needed. Participants of OPD can participate in PD irrespective of their location as well as continuing working at the same time (Stanford-Bowers, 2008). Moreover, teachers have choices among countless courses in different areas which pique and hold their interest. The learning resources are no longer available for a limited period (Borko, Whitcomb, & Liston, 2009) but also available on demand. OPD offers the participant the opportunity to access readily

available resources repeatedly. The learner controls the flow of information (Thomas et al., 2012). As noted by Reeves and Pedulla (2011) OPD has eliminated many barriers in training of in-service teachers in terms of access and schedule among others. Online professional development is flexible in terms of accessibility and availability.

Brooks and Gibson (2012) identify three emerging themes across the literature. These are personalisation, practice-focused and community-based. These themes have the possibility to overcome principal barriers in providing effective teacher learning, focusing on current technologies while at the same time providing space for teachers' collaboration at both national and international levels in a collegial manner. Teachers have opportunities to engage with scholars as well, which is difficult in a face-to-face approach due to the cost that this could involve.

Web-based learning offers the opportunity for personalised learning to occur. Learning happens when there is individual investment and the learning outcomes are related to their subject matter (Diaz-Maggioli, 2004; Fullan, Hill, & Crévola, 2006). In a way, "Web 2.0 professional development is more self-paced and a flexibly responsive approach to individual interests and needs" (Fontichiaro, 2008, p. 30). Dede (2006) claimed that tailor-made teachers' PD using technologies fit their busy schedules by providing support as and when required. Teachers can actively participate in PD activities. They can contribute to knowledge through their reflections, which is not present in face-to-face settings (Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009). At the same time their experiences in using online technologies definitely enhance their technological skills.

Online professional development offers the possibility of creating a community of professionals. Teachers can interact in real time with their colleagues locally or remotely. Compared to computer-based learning, traditional education does not promote cooperative learning (McConnell, 2000). Through cooperative learning, teachers have the opportunity to reflect on their own practices and also those of their colleagues. Windschitl (2002) argues that effective professional development occurs when participants make explicit arguments and reflect on their own practices. The exchange among participants can be ongoing. The sharing of knowledge is a powerful tool to change practices, teachers can adjust or change their own teaching practice using the expertise of their colleagues (Meirink, Meijer & Verloop, 2007). Online technologies can connect schools to schools, teachers to teachers or

schools to states. This online space can be vital for teachers to talk about critical issues such as test standardisation (Albers et al., 2016). Thus, educators' learning can be supported and extended with regard to critical pedagogy and practice through the community of professionals. Teachers can arrange blogging to comment on new work as they proceed with the curriculum content. In a study of students at the University located in the West of England, it was found that they were satisfied with using online tools as a support to build their skills (Moule, Ward & Lockyer, 2010). When they were outside the campus, they communicated with their peers who were on campus using social applications.

Online PD focuses on practice, which includes real-world, authentic tasks and activities directly related to teachers' professional practices (Vrasidas & Glass, 2004). Because of Web 2.0 technology, online PD is no longer limited, compared to the period of Web 1.0 where teachers were able to only access resources. Now with Web 2.0 teachers can add knowledge, for example, their experiences or reflections, among others, which are directly connected to their situation. Further, Brooks and Gibson (2012) noted that few teachers have the opportunity to observe their colleagues' practices, which is useful to them. Teachers' learning can be supported by using video, as noted by Brunvand (2010), as it is a way of showing teachers how to act in classroom situations (Sherin & van Es, 2005), in other words, it is a way of linking theory to practice (Wang & Hartley, 2003). While using video, the teacher sees the implementation of the lesson plan rather than just looking at the lesson plan (Sung, 2009). With online PD, teachers can share videos, plans, resources, experiences and discuss among themselves (Whitehouse, 2010). Some OPD programmes, while rare, contain demonstrations of expert teachers in classroom situations (Wang & Hartley, 2003; Boehm et al., 2012). The content of online professional programmes is flexible. It can be easily updated to remain relevant. Anderson (2002) found that teachers preferred to be trained by other teachers rather than external trainers. In a study, Whitehouse (2010) found that when teachers have the opportunity to access others' work and have the chance to discuss these activities, it helped them to have confidence in their own ability. Online learning encourages more reflection, intimacy, and community than face-to-face interactions (Miller, 2013). E-learning is not only a learning tool, but also a space where teachers can engage in relevant, purposeful and critical discussion to upgrade their classroom practices. Teachers have time to reflect on others' work or experiences. The space is not only to share

views but also to raise questions which may help in teachers' transformation, pedagogical support, and strategy sharing (Albers et al., 2016). The content is tailored to the specific needs and interests of teachers, as they may experience the same problems even though the context may not be the same. The solutions can be adapted to the context. Table 2.1 provides a comparison between the emerging professional development and traditional professional development.

Table 2.1: Comparison of traditional professional development and the emerging professional development for teachers

Features of traditional PD	Features of the emerging PD
A "fit-in" approach	A growth-driven method
Programme ownership is missing between teachers	Programmes are constructed collectively
Top-down decision making	Shared decision making
Fixed and untimely delivery mode	Varied and timely delivery mode
One-size-fits-all methods	Custom-made techniques
Perspective ideas	Inquiry-based ideas
Decontextualized programmes	Context-specific programmes
Little or no follow-up	Adequate support systems
Pedagogical (child-centred) instruction	Andragogy (adult-centred) instruction
Lack of proper evaluation	Proactive assessment

2.4.4 Barriers to online professional development

There may be a face-to-face session to explain to teachers what online professional development is, the expectations, objectives, activities and a tour through the available resources first, as teachers are not used to online professional development programmes compared to face-to-face PD programmes. Teachers can ask questions to clear up uncertainties. On the other hand, Treacy, Kleiman, and Peterson (2002) added that teachers participating in OPD must have suitable access to computer or ICT devices connected to a trusted internet connection, preferably both at home and school. As a lack of internet access is creating a new form of exclusion today (Tondeur, Sinnaeve, van Houtte & van Braak, 2011). Teachers engaging in OPD must have a trustworthy internet connection at school as well as at home to ensure that the assumption that OPD is accessible at any time and place can still be true. CENAR, (Committee on Enhancing Professional Development for Teachers, National Academies Teacher Advisory Council, and National Research Council, 2007),

pointed out that, besides computer skills, the facility to access to technology is a very important concern for those implementing OPD. Computer skills of teachers appear to be an important construct (Reeves & Li, 2012) for effective OPD implementation. Continuous deficiency of infrastructure and support in schools possibly will prevent teachers from benefiting from OPD. Participants may hesitate to jump into online learning if they lack the confidence in gaining the required skills to interact successfully with the new online approach (Muilenburg & Berge 2005; Tallent-Runnels et al., 2006); this concern is relevant to the implementation of OPD in other fields such as higher education and nursing (Benson 2004; Oliver & Herrington 2002). Teachers can find it difficult to navigate through complicated websites (DeTure, 2004), as there is insufficient visual cues and instantaneous feedback.

Most of the teachers are not digital natives; they have been raised and educated using the old face-to-face system and have to teach in the information age. They have to learn new ways of learning including new codes for communicating. But some teachers tend to stick to the past and are very slow to change. Furthermore, there are some unreliable PD products, as developers tend to market these products without testing due to lack of time, as demand is urgent (Borko; Whitcomb & Liston, 2009). Thus, teachers tend to lose their trust in these PD products. This leads to participants' problems regarding self-efficacy, belief and motivation (Kao, Wu & Tsai, 2011; Yuen & Ma, 2008), resulting in the development of negative feelings towards OPD. But all PD programmes are designed with the objective of bringing constructive transformation in knowledge, skills, beliefs or behaviours (Guskey, 2002; Lauer et al., 2014). As for the Mauritian case, the technologies have to be imported from developed countries and adapted to the local context. Therefore, if teachers develop negative feelings towards these technologies, they would lose trust in these products which were intended to help teachers in their teaching. Teachers have to create learning activities including these new technologies even though little or no social media and formal training in digital has been provided (Whitehouse, Reynolds, & Caperton, 2009). Furthermore, technology is evolving faster than it can be integrated into educational materials such as textbooks.

Clary & Wandersee (2009) argued that teachers may favour applied experiences compared to experiences perceived as less practical using sophisticated technology. Some

teachers prefer real-time classroom application courses (Hodgson, Lazarus, & Thurlow, 2011). Moreover, if too much support is being provided or the participants are not encouraged to develop their own responses as the facilitator is providing the answers, this may limit the quality of teachers' discussions (Kale et al., 2009; Mitchem et al., 2008). Yet no conclusive evidence of how effective online training is, has been determined (Whitehouse, Breit, McCloskey, Ketelhut, & Dede, 2006). So, shifting to online learning deserves special attention.

But online learning settings claimed to increase interaction and cooperation, although Sawchuk (2009) also stated that as online learning provides the option that the participant can work alone at his or her convenient time it does not nurture collaboration among teachers. To the contrary, enculturation and mastery professional practice like teaching requires a socially constructed understanding emerging from active interaction. Enculturation is the process by which persons learn and develop skills and knowledge to be able to participate in cultural practices, so that they can form part in the community. This process occurs mostly through experiences. Both enculturation and personal interaction are difficult to transfer in an online environment.

As Massive Open Online Courses (MOOCs) are emerging rapidly, teacher education will also be affected. The emerging technologies such as virtual reality, augmented reality and artificial intelligence can be used to enhance TPD by enabling teachers' access to mentors, colleagues, and resources through a web-based Virtual Teaching and Learning Community (VTLC) system (Vrasidas & Glass, 2007). Through such a system, teachers can get access to interactive, self-paced, and collaborative resources. Courses offered in such a system are mostly informal, so recognition, validation and accreditation of non-formal and informal learning need to be addressed. According to Singh (2012) recognition, validation and accreditation of these two ways of learning are vital aspects in encouraging lifelong learning, as lifelong learning is more than just formal learning and training. Singh (2012, p. 8) has defined "recognition, validation and accreditation" as follows:

Recognition is a process of granting official status to learning outcomes and/or competences, which can lead to the acknowledgement of their value in society.

Validation is the confirmation by an approved body that learning outcomes or competencies acquired by an individual have been assessed against reference points or standards through predefined assessment methodologies.

Accreditation is a process by which an approved body, on the basis of assessment of learning outcomes and/or competences according to different purposes and methods, awards qualifications (certificates, diplomas or titles), or grants equivalences, credit units or exemptions, or issues documents such as portfolios of competences. In some cases, the term accreditation applies to the evaluation of the quality of an institution or a programme as a whole.”

Thus, the researcher concludes that as OPD is an emerging area in educational research, studies are needed to support the claim that OPD can effectively improve teacher knowledge, instructional practices, and short-range student achievement outcomes (O’Dwyer et al. 2010). The study of OPD is still in a developing stage (Badynee, 2015; Fishman et al., 2013; Koc, Peker, & Osmanoglu, 2009; Ranieri & Pezzati, 2017; Russell et al., 2009). The gap in the literature is that there is limited research regarding the driving factors for learners to be successful in online professional development (Vu, Cao, Vu & Cepero, 2014). Therefore, more and more research must be carried out concerning the effectiveness of OPD in the educational system and how it is related to teachers’ beliefs. As Schleicher (2012, p. 73) pointed out, teachers must become “active agents of their own professional growth”. Effective professional development must be ongoing, in-depth, actively engaging and sustainable. As teachers’ career pathways are often cyclic and recursive, a wide range of practices is needed at various levels for effective online professional development. These practices comprise collaborative learning, peer-assisted learning, teacher-researcher, teacher-as-student, independent learning, integrated approaches and learning communities. For instance, to motivate adults’ engagement in online learning, the activities must be relevant and meaningful. More importantly, it must be their choice. Therefore, we need to explore what teachers think to be available in the online professional development activities, and how they construct their beliefs about online learning and, furthermore, how to reduce the challenges that ICT tools exert on teachers (Hamalainen & Hakkinen, 2009) as these slow down OPD implementation.

2.5 Conception of teacher beliefs

2.5.1 Beliefs

Belief is how an individual organises his or her view of truth or falsity towards a proposition about the world. Beliefs refer to suppositions, commitments, and ideologies and no truth condition is required (Savasci-Acikalın, 2009). Mansour (2009) argued that beliefs form part of concepts that are difficult to define; he also added that recent study shows that as teachers' beliefs have the tendency to be more experience-based than theory-based, beliefs cannot be defined clearly and do not have a single clarification. Belief is an opinion about something you think is true (Oxford dictionary). In the educational field, beliefs are defined as "one's convictions, philosophy, tenets, or opinions about teaching and learning" (Haney et al. 2003, p. 367).

Beliefs are referred to as the most important psychological construct to teacher education (Pintrich 1990), but are recognised as being extremely challenging to define. Pajares (1992, p. 2) classifying these beliefs as a "messy construct [that] travels in disguise and often under alias". These aliases comprise "explicit propositions" (Nisbett & Ross, 1980), "teachers' subjectively reasonable beliefs" (Harootunian & Yarger 1981), "implicit theories" (Clark and Peterson 1986), "conceptions" (Ekeblad & Bond 1994), "personal theories" (Borg 1999), "personal pedagogical systems" (Borg 1998), "judgements" (Yero, 2002) "untested assumptions" (Calderhead, 1996), "perceptions" (Schulz, 2001), "pedagogical principles" (Breen, Hird, Milton, Oliver & Thwaite, 2001), "theories for practice" (Burns 1996), "images" (Golombek, 1998) and "maxims" (Richards, 1996). While Hermans and colleagues (2008) stated that "belief systems consist of an eclectic mix of rules of thumb, generalizations, opinions, values and expectations grouped in a more or less structured way" (p. 1500). These belief systems affect the way technology is used by teachers (Angers & Machtmes, 2005; Hermans et al., 2008).

2.5.2 Types of beliefs

Ford (1992) indicated that: "personal agency beliefs play a particularly crucial role in situations that are of the greatest developmental significance – those involving challenging but attainable goals. Consequently, they are often key targets of intervention for parents, teachers, counsellors and others interested in promoting effective functioning" (pp. 124–

125). Thus, beliefs play a decisive role in teachers' professional development (online or face-to-face). As the purpose of PD is to improve teaching and learning, which is a challenging goal in the educational system, therefore it is imperative to study the beliefs of teachers about PD and how they are constructed. Ford (1992) found two types of beliefs, namely, capability and context beliefs. Personal agency beliefs, which are a combination of capability and context beliefs, control the level motivation level a person need to attain a particular objective (Ford, 1992). Teachers' beliefs encompass beliefs about related educational components (Porter & Freeman, 1986). In teacher professional development, the objectives are that teachers acquire pedagogical knowledge and skills expected to improve students' performance. Their motivations for participating in online professional development are influenced by their capability and context beliefs.

2.5.3 Context beliefs

Context beliefs are beliefs that guide response to the environment (external factors and/or people). Control beliefs are occasionally known as perceptions of control and are the same as Ajzen and Madden's (1986) perceived behavioural control construct and Bandura's (1997) outcome expectancy construct (Lumpe, Charlene, Haney, & Beltyukova, 2010). The role of the whole context to meet the desired goals forms part of context beliefs. In the case of professional development for secondary school teachers, context beliefs would consist of students, rectors, managers, parents, teachers, institutions and the physical environment. The online learning evolves in a virtual environment for online PD for secondary school teachers. The researcher would also include virtual environment in the previous list. In an educational system, contexts can be generally categorised into school environment (equipment, buildings), human environment (parents, faculty, students), and socio-cultural environment (cultural norms, policy) (Ford, 1992). Belief changes from context to context. Thus, changing one of the variables changes the context, implying changing teachers' beliefs.

2.5.4 Capability beliefs

Bandura (1997) has studied the concept of self-efficacy beliefs and is like Ford's (1992) concept of capability beliefs which is somebody's belief about his/her ability. Self-efficacy beliefs define the way people motivate themselves, behave, feel and think.

Cognitive, motivational, affective and selection processes are four major processes through which various beliefs are produced. Teachers' self-efficacy will probably increase through mastery experiences, acquired through determination, or/and through professional development courses and supported by feedback from colleagues or trainers in a non-threatening environment, assuming that teachers have certain capabilities (Bandura 2006). Self-efficacy is the capacity to anticipate difficulty and the ability to judge the ability to complete a task (Pajares & Urdan, 2006). Such beliefs improve human accomplishment and personal well-being, hence fostering intrinsic interest (Xu, 2012). Therefore, teachers must have vigorous self-efficacy to sustain the perseverance needed to be successful in online professional development programmes. A key factor in online learning is self-efficacy (Cho & Jonassen, 2009; Cho, Shen, & Laffey, 2010). Ermeling (2010) stated that, in the beginning, experienced teachers also have difficulties with a new instructional technique. If teachers have high self-efficacy beliefs, they can adopt an efficacious behaviour towards online professional development, thereby promoting progress in their professions, as teachers' self-efficacy determines their behaviour. Lim (2001) added that a major predictor for online learners' fulfilment and their intention to engage in online courses in the future was self-efficacy. Lim's opinion was later confirmed by Womble (2008) and McGhee (2010) who showed that the relationship between e-learning self-efficacy and learner's satisfaction is significant and positive. Gender is another factor which influences teachers' feelings of self-efficacy (Sang, Valcke, Braak, & Tondeur, 2010; Schere & Siddiq, 2015). In some studies, females have been reported to consider themselves as less ICT competent than males (Durdell & Haag, 2002; Scherer & Siddiq, 2015; Sieverding & Koch, 2009). Males tend to attribute their failure to external factors (Koch, Müller & Sieverding, 2008). But other researchers do not find such influence of gender on self-efficacy beliefs (Compton, Burkett, & Burkett, 2003; Pamuk & Peker, 2009).

A study carried out by Piper (2003) provides evidence that among teachers who use technology in their classroom, skills and knowledge may be seen as less important than self-efficacy. Therefore, to increase teachers' confidence in using technology to achieve student learning objectives rather than just to do administrative and communicative activities, time and effort must be provided (Ertmer & Ottenbreit-Leftwich, 2010). Teachers' confidence will not increase as long as they have not witnessed how technology helps student success.

We can start with small successful experiences; this increases teachers' confidence (Ottenbreit-Leftwich, 2007). Self-efficacy may not be enough to value technology as an instructional tool. Therefore, we need to explore another factor that may influence teachers' beliefs about OPD is their pedagogical beliefs.

2.5.5 Pedagogical beliefs

“Teachers’ understandings, assumptions or propositions about teaching and learning constitute pedagogical beliefs” (Lim, Tondeur, Nastiti & Pagram, 2014, p. 3). Therefore, these beliefs play an important role in teachers’ pedagogical decisions concerning how and whether to use technology in their classroom practices (Deng, Chai, Tsai, & Lee, 2014; Inan & Lowther, 2010). These beliefs are normally considered as the knowledge construction view or the knowledge transmission view (Teo et al., 2008; Wong et al., 2009). In the knowledge transmission view lessons are prepared and disseminated in a teacher-centred and content-oriented way, whereas through the knowledge construction view, the students are active. The teacher designs learning experiences based on the students’ previous experiences. Teachers’ pedagogical beliefs greatly influence their classroom practices (Fives & Gill, 2015; Kagan, 1992; Pajares, 1992; Richardson, 1996). Using online professional development of teachers to resolve teachers’ pedagogical beliefs can be crucial in changing teachers’ instructional practices to enhance student learning outcomes. An adaptive teacher education related to teachers’ beliefs is more likely to be accepted by teachers (Ertmer, 2005; Lim et al., 2013) in contrast to the current traditional face-to-face teacher education. Becker and Ravitz (1999) claim that pedagogical practices of teachers and beliefs are constantly fashioned by their continuing experiences as teachers. Thus, action which resulted from beliefs, in turn lead to the formation of new, reconstructed or reaffirmed beliefs (Haney et al., 2002). Also, OPD must help in redirecting teachers’ “to focus on pedagogy rather than on the technology itself” (O’Rourke, 2001, p. 13). But teachers are expected to accept innovative strategies that are related to what they believe pertaining to teaching and learning (Lim et al., 2013). It is clear that teachers have access to technology as described in the introduction chapter, but the ability to use it in their classroom or in their own education is lagging behind. Prior studies which recognise that the way learners learn is influenced by their experiences, personalities and characteristics (Daniel, 2014). Since learners have

different learning styles. Therefore, all these learning styles must be integrated in each course. Some learners may be fast, while others may be slow in mastering the required skills (Daniel, 2014). Moreover, as suggested by Nespor (1987), educational change is not about leaving pedagogical beliefs, but progressively substituting or enriching these pedagogical beliefs with system beliefs which are relevant to teachers' instructional context. Therefore, short PD courses' objectives need to be clear and related to teachers' needs (Lauer et al., 2014).

2.5.6 Challenging beliefs

After having critically studied some types of beliefs that teachers hold, some ways to challenge these beliefs are presented to intentionally change them. But as stated in the previous chapters, these beliefs are hard to transform as they are static in nature. Therefore, beliefs must be challenged deliberately for changes to occur, as Pajares (1992) argues. He also explains that beliefs will tend to change when they are proved to be unsatisfactory and this will not occur unless they are challenged. In fact, as beliefs are static in nature, they remain difficult to change even when they are challenged. Here is Pajares' explanation about why beliefs are resistant to change:

“[Beliefs] help individuals to identify with one another and form groups and social systems. On a social and cultural level, they provide elements of structure, order, direction and shared values. From both a personal and socio/cultural perspective, belief systems reduce dissonance and confusion, even when dissonance is logically justified by the inconsistent beliefs one holds. This is one reason why they acquire emotional dimensions and resist change. People grow comfortable with their beliefs, and these beliefs become their “self” so that individuals come to be identified and understood by the very nature of the beliefs, the habits they own” (p. 317).

Nisbett and Ross (1980) advocate that beliefs influence a person's perception and strongly affect the processing of new information therefore, the earlier a belief is integrated into a person's belief structure, it is more difficult to modify. Therefore, as previous beliefs become more and more strong, this results in what Nisbett and Ross (1980) call “the perseverance phenomena of theory maintenance”. Thus, it will be difficult to change teachers' beliefs about teaching and learning developed for the duration of their schooling. Furthermore, it is more difficult to change beliefs which are more tightly interconnected and the more central they are with other beliefs (Woods, 1996). In this interconnected network

of beliefs, teachers find it very difficult to change one belief without affecting the other beliefs. So for teachers to cultivate innovative practices and to leave deep-rooted and apparently successful practices, they will require to shift their beliefs and accept new ones. Woods (1996) states that change in beliefs must be encouraged rather than mandated as this process may lead to disorientation and frustration as the belief systems are personal in nature.

Teachers need to be conscious of their own beliefs before they can be expected to change them (Crandall, 2000) as teachers can hold unconscious beliefs. Since teacher's beliefs play a critical role in their profession, so it is important for teachers to understand their own beliefs, theories or philosophy (Williams & Burden, 1997). Williams and Burden claim teachers need to sustain their personal reflection process to be aware of their beliefs and understand how these beliefs affect their professional practices. They explain:

“Teachers’ beliefs about what learning is will affect everything they do in the classroom, whether these beliefs are implicit or explicit. Even if a teacher acts spontaneously or from habit, without thinking about the action, such actions are nevertheless prompted by a deep-rooted belief that may never have been articulated or made explicit. If the teacher-as-educator is one who is constantly re-evaluating in the light of new knowledge his or her beliefs about language, or about how language is learnt, or about education as a whole, then it is crucial that teachers first understand and articulate their own theoretical perspectives” (p. 56).

Teacher training programmes must help teachers to understand their beliefs so that they can use them to reflect on the teaching (Richards, 1996). Teachers can make connections between their beliefs, only when they are aware of such beliefs and routine practical. Thus, when changes arise, teachers can re-examine their beliefs to embrace new practices. Instructional change can take place only by altering existing beliefs (Dwyer, Ringstaff & Sandholtz, 1991). But as Nespor (1987) highlighted, this transformation is not just a consequence of abandoning current beliefs, but progressively changing them with those which are more appropriate. The dominated training paradigm about teacher learning where the school and teachers are not the central change agents must be changed to improve the professional development approach. It is only when teachers will be part of the goal-setting process that they will personally invest and motivate to participate in workshops and apply

the learning materials in their classroom settings (Guskey, 1986). Guskey maintains that teachers must have the opportunity to establish goals for professional development.

2.5.7 Situating the conception of teacher beliefs

The original objective of research on teachers' beliefs was to form psychological constructs that could be used to explain and provide a system to predict explanation of teachers' practice differences (Abrami, Poulsen, & Chambers, 2004), and students' outcomes (Muijs & Reynolds, 2002) and experiences (McAlpine, Eriks-Brophy, & Crago, 1996). Moreover, existing studies on teachers' beliefs published in more than 700 articles conclude that there is an absence of cohesion and clear conception, and limited explanation of teachers' beliefs (Fives & Buehl, 2012). Literature in the field claimed that it is difficult to define teachers' beliefs (Johnson, 1994; Pajares, 1992). Leder and Forgasz (2002) added that it is difficult to have an accurate definition of beliefs as the latter cannot be observed directly and researchers have to refer to teachers' statements. On the other hand, Fives and Buehl (2012) disagreed with this statement and concluded that authors have provided definitions for teachers' beliefs but these definitions are inconsistent. With regard to previous studies, Thompson (1992) concentrated on quantitative studies of teachers' beliefs related to mathematics, whereas Kagan (1992) reviewed longitudinal studies of pre-service and novice teachers. This demonstrates that more qualitative studies must be carried out regarding teachers' beliefs to add knowledge to existing findings, even though some features of teachers' beliefs have been agreed upon collaboratively (Fang, 1996; Kagan, 1992; Nespor, 1987; Pajares, 1992; Woolfolk Hoy, Davis, & Pape, 2006).

The researcher has conducted an exploratory mixed-methods approach to explore and understand teachers' beliefs about online PD learning in the Mauritian context. Beliefs are regularly conceptualised as understandings, evidence, or suggestions that are psychologically held and felt to be true (Zheng, 2009). They represent a dynamic filter which screens novel knowledge and experiences for meanings. Harvey (1986), pointed out that "a belief system is a set of conceptual representations which signify to its holder a reality or given the state of affairs of sufficient validity, truth or trustworthiness to warrant reliance upon it as a guide to personal thought and action" (p. 146). Pajares (1992) added that this belief system acts as a personal guide through which individuals define and understand the

world and themselves. Van Driel, Bulte and Verloop, (2007) have characterised the nature of teacher beliefs in terms of affective, evaluative and episodic processes. Nespor (1987), added that beliefs are generated by the content of episodic memory which holds experiences, knowledge or episodes from cultural sources which play a significant role in judging and assessing data collected. This supports the assumption that teachers' beliefs, which are a subset of the general belief system guide their planning, decision making, the way they engage in professional development activities, and their classroom practices. Teachers' beliefs may behave as a filter to change (Yerrick, Parke, & Nugent, 1997). Therefore, teachers' beliefs would influence their decision of whether to engage or not, and also the way teachers engage in online professional development. There is still confusion about belief and its relation to knowledge in current literature. The distinction between the two is still blurred in many teacher beliefs studies. The trend is not to treat belief and its relation to knowledge in isolation. Therefore, the same tendency will be followed. Borg (2003) has conceptualised teachers' beliefs as "teacher cognition as teachers' knowledge, theories, attitudes, images, assumptions, metaphors, conceptions, perspective about teaching, teachers, learning, students, subject matter, curricula, materials, instructional activities, and self" (p. 81). Verloop et al. (2001) stressed that it is hard to distinguish whether teachers are referring to their knowledge or belief during planning or decision making in their professions.

The concept of beliefs that will be used in this study is that beliefs refer to commitments, suppositions and ideologies and a truth condition is not required (Savasci-Acikalin, 2009). Teachers' beliefs include beliefs about environment or content; self; content or knowledge; teaching approach and students; and specific teaching practices. Teachers' beliefs are implicit (unaware) and explicit (conscious). The fact that teachers' beliefs are implicit is a common view shared by researchers (for example, Kagan, 1992; Osioma & Moscovici, 2008). Teachers' beliefs are guided by implicit beliefs which filter the teaching experiences interpretation with the latter being conscious. Nespor (1987) added that implicit beliefs are beyond the teachers' control. Other researchers recognised that certain beliefs can be explicit to the teacher (for example Rimm-Kaufman, Storm, Sawyer, Pianta, & LaParo, 2006). Dewey (1986) claimed that beliefs need both intellectual and practical commitment.

This research studies teachers' beliefs (behavioural, rational, conscious and unconscious) in response to or related to online professional development programmes

designed to influence practices of in-service teachers, as beliefs affect one's behaviour. The researcher explored teachers' beliefs about knowledge and learning (considering programme duration, the content and delivery mode) as well as beliefs about effective ways to develop professionally. Finally, the researcher explores how such beliefs are related to OPD and also the factors that influence the beliefs of teachers about OPD as few research which explore OPD and its effectiveness has been carried out (Borko, Whitcomb, & Liston, 2009; Whitehouse, Breit, McCloskey, Ketelhut, & Dede, 2006). Also, a serious need for research in terms of availability and high-quality OPD programmes has been identified in the literature (Dede et al., 2009; Sprague, 2006). Furthermore, Rosenfeld and Rosenfeld (2008) have concluded in their study that teachers' PD should be connected to teachers' belief systems.

2.5.8 Nature of teachers' beliefs

Being described as a "messy construct" by different researchers such as Hermans et al. (2008), in-service teachers' beliefs are more profound as they have many years of experience in teaching, which may make it difficult to change (Fullan, 2007). Many studies which emphasise change in teachers' beliefs draw upon Green's (1971) work which described belief systems by explaining the relationship between teachers' beliefs and practice (Arvola & Albright, 1995; Becker & Pence, 1996; Cooney, Shealy, & Arvola, 1998; Mewborn, 2000; Shealy, 1994). Green (1971) also claimed that conflicting beliefs are prevented as they are held by individuals or in isolated groups. These groups are likely to develop when beliefs are formed in different contexts. For example, a teacher might believe that he or she is not at ease in using an online professional development platform. The belief may perhaps be due to the negative experiences with such programmes and at the same time as a belief in him- or herself. The same teacher admits having the technological skill to upload or download materials through Facebook or Twitter, while in the theory of planned behaviour proposed by Ajzen and Fishbein (1980) the stress is on the context in which the beliefs occur as regards the aspects of place, action or behaviour, time and subject. Therefore, beliefs need to be described taking into consideration each of these aspects of context to predict behaviour (Beswick, 2003). Sullivan and Mousley (2001) recognise the significant influence of contextual constraints on the relation of beliefs and practice. Teachers, therefore,

construct their beliefs based on their experiences which are situated in a context, as described by Hoyles (1992). Thus, beliefs are contextual in nature and not isolated units (Pajares, 1992). Beswick (2005a) insisted that the connection nature of beliefs and practice is complex and subject to controversy. So the context in which teachers are practising shapes their beliefs, therefore changing one variable such as the site that is moving towards online professional development will change teachers' beliefs about professional development programmes. Cobb et al. (1990) contended changed practice leads to changed beliefs.

2.6 Beliefs about online professional development

Teachers hold an array of beliefs in different areas such as their work, their subject matter, their students and their roles and responsibilities (Kuzborska, 2011), and the schools in which they work (Nespor, 1987). Calderhead (1996) argued that teachers hold significant beliefs in five key areas which are 1) beliefs about the nature and objective of teaching; 2) beliefs about their students and the way they learn; 3) beliefs about a subject, for example, what computer education is about; 4) beliefs about themselves; and 5) beliefs about learning to teach. Teachers' beliefs in this study refer to Mauritian secondary school teachers' beliefs about 1) their roles; 2) learning to teach; 3) about a subject; and 4) nature and objectives of teaching which form part of the professional development objectives. The focus is their beliefs about online professional development or using computer-mediated technology for continuous learning.

As online teacher-training programmes are emerging, there is an urgency to study teachers' beliefs about OPD programmes for teachers, as what teachers think and do is the replication of their beliefs (Johnson, 1994; Phipps, 2007). Teachers have different interpretations of online professional development. The interpretations may be affected by their beliefs and attitudes (Anderson, 2007; Crawford, 2007), which will considerably influence the implementation of online professional development. As regards belief theory, Schommer (1998) argues that adults' beliefs are related and influenced by their working and learning. Therefore, it is vital to explore teachers' beliefs about OPD if they are to engage with it for professional growth. Pajares (1992) mentioned that "beliefs are the best indicators of the decisions individuals make throughout their lives" (p. 307), and highlighted that teachers' beliefs are related to their planning, instructional decisions and classroom practices.

Teachers' beliefs are considered to be even more significant than teachers' knowledge (Pajares, 1992). Rosenfeld and Rosenfeld (2008) found in their study on a teacher PD programme that mediated PD activities produced a rise in teacher beliefs about student learning. This may occur in future OPD programmes if the activities are mediated. To differentiate between effective and ineffective PD, Timperley and Alton-Lee (2008) stressed two main factors which are the content and teachers' engagement with the learning process. To be more effective, models of professional development must comprise skills development, understanding instructional practices (Dall'Alba & Sandberg, 2006; Jetton & Alexander, 1997), assessment of students and considering the environment in which the instruction and learning are taking place (Guskey, 2003a). Teachers' engagement is directly related to teachers' beliefs. In an OPD environment lack of internet access and/or computer skills will hinder teachers' engagement.

2.6.1 Impact of school culture

Sirotnik (1989) has stated that the "ultimate power to change is and always has been in the heads, hands, and hearts of the educators who work in our schools" (p. 109). Therefore, to enhance or to upgrade teachers' knowledge and capabilities professional development must go where the action is, that is in the school. Sirotnik's statement is still relevant in our educational system where teachers remain the key components in education reform. Despite this statement, most professional development programmes are still offered outside the schools; hence, the school context is not taken into account. Ignoring organisational culture was the main ground why PD or training has failed to improve teachers' knowledge (Bunch, 2007). In our context, although the MIE has been providing professional development for teachers for a long period of time, the outcome is still disappointing as the pass rate is not increasing, as discussed in section 1.2.2. Although one objective of professional development is to improve students' achievement as stated by the National Foundation for the Improvement of Education (1996), "the goal of professional development for teachers is to increase student learning" (p. xiii). Since a recent paradigm of professional development has developed, the one-day off-site "one-size fits all" training is being gradually substituted by PD that lasts over a long duration (Garet et al., 2001) and integrates research on what is

known about how people learn (Bransford, Brown, & Cocking, 2000), and is situated within the teacher's workplace, that is the school (McLaughlin & Talbert, 2006).

Traditional professional development programmes do not recognise teachers' diversity (Lieberman & Wood, 2001; Siskin, 1994), what teachers know about practice is not taken into consideration (Lampert & Ball, 1999), are not often developmental (Ball & Cohen, 1999), are content free and not related to the context as stated earlier. These programmes ignore teacher's individual needs and their contribution in their individual professional growth. The programmes focus on knowledge transmission rather than enable teachers to construct new knowledge. In the US the No Child Left Behind Act of 2001 too has failed to define what it calls "high-quality professional development" (Borko, p. 3). Hawley and Valli (1999) have listed some factors that contribute for an effective professional development. These factors are engaging teachers in solving problems together; supported, continuously, uninterrupted, rich information; helping teachers to construct understanding with regard to theories about the elements concerned by change and reform. They added that professional development must be linked to teachers' context and learner centred. The school must encourage teachers to come together with the materials from their classrooms and students' work and discuss in a practice community. Researchers have warned that professional development would remain ineffective as long as it is not related to the context and not grounded in learning practices. Brown and Duguid (1991), among others, called this as "community of practice", as very often teachers meet informally and ask questions, provide solutions, construct answers together and discuss changes in their work. Today with technology these informal meetings can happen online. Valuable training can be offered for new members through these communities of practice (Klein, 2007). But informal professional development activities must be aligned and balanced with school-based formal professional development. There must be a converging shared vision for professional development which is "career-long, context-specific, continuous effort that is guided by standards, grounded in the teacher's own work, focused on student learning, and tailored to the teacher's stage of career development" (Schlager & Fusco, 2004, p. 5). The school-based professional development can be a way to resolve the problem of ineffective professional development programmes which are disconnected from practice, fragmented and misaligned. One common barrier to effective school-based professional development is teachers'

reluctance to engage in inquiry or dialogue that evaluates the practice of their peers (Grossman, Wineburg, & Woolworth, 2000). Furthermore, teaching may have basically developed a culture of privacy; therefore, teachers have difficulties in reflecting on their own practices (Little, 1990), according to Ball and Cohen (1999), this because certain professional dispositions of are absent or because their personal identities are closely tied to their classroom practices.

The school culture must promote professionalism and offer opportunities for sharing, risk taking, and reflection among teachers about pedagogy and student learning (Blumenfeld, Fishman, Krajcik, Marx & Soloway, 2000). Therefore, to promote this sharing among teachers the transactional distance must be reduced to facilitate social interaction, which becomes more difficult when transactional distance increases (Boelens, De Wever & Voet, 2017). The psychological and communication space in terms of time and space is called transactional distance (Moore, 1993). An effective method to facilitate interaction is to use the blended learning approach in the school context (Ausburn, 2004; Rovai, 2003), as it can reduce the aspect of time and space in the learning environment.

2.6.2 Impact of technological beliefs

Teachers fear being replaced by technology; therefore, they continue to teach their students through the traditional approach. But technology will never transform education on its own. Stakeholders in education such as teachers need to find solution and apply them to transform education (Aesaert et al., 2013) as this transformation will not happen overnight (Peters, 2017). Teachers are the key for the effective and proper use of technology; thus technology will never replace teachers. They are needed to integrate technology in their curriculum so as to improve knowledge acquisition as well as skills development of their students. In the 21st century, teachers need TPCK (Mishra & Koehler, 2006; Niess, 2005). Teachers need technology to create online resources to be used in their classroom (TPCK). But even though PCs have been introduced in classrooms during the past 20 years, the impact on teaching and learning is minimal (Reilly & Sandholtz, 2004). So teachers need professional development to help them in integrating technology in their teaching. Online professional development can be a powerful way for teachers to work collaboratively so that they can improve their practices at a greater rate (Ronfeldt et al., 2015) as well as their

technological skills. However, such programmes need to be constantly innovated, evaluated and, more importantly, share positive and negative experiences of the online PD programmes.

The online learning can be in blended mode whose design environment must be able to cater for these important challenges: (1) helping students' learning processes; (2) encouraging interaction; (3) incorporating flexibility; and (4) nurturing an effective learning environment (Boelens, De Wever, & Voet, 2017). Blended learning provides several new opportunities to boost teaching and learning (Spanjers et al., 2015). As far as blended learning implementation is concerned, practitioners and researchers are still struggling (Moskal, Dziuban & Hartman, 2013). The reason that is often used to combine face-to-face with online learning is that it increases learners' flexibility (Bonk, Kim & Zeng, 2006; Graham, 2006; Graham, Allen & Ure, 2005), but it is more than that, as blended learning is referred as a more effective pedagogy (Graham, 2006; Joosten, Barth, Harness & Weber, 2014), or improved cost-effective (Graham, 2006). The learners control their learning in terms of time, place, path, or pace more effectively as flexibility increases (Horn & Staker, 2014), as blended learning can be asynchronous instead of synchronous, the learners can study anywhere and do not need to be with their peers at the same time in a classroom (Osguthorpe & Graham, 2003). Additionally, the learners can determine the order of accessing the content provided online (Van Laer & Elen, 2016) and also learn at their own pace (Horn & Staker, 2014). The learners can select topics that interest them. Finally, the learners have the possibility to select the most appropriate mode of learning, which can be face-to-face and/or online learning (Owston et al., 2013). But some learners need the flexibility of blended learning and at the same time they feel that human touch and the social interaction present in face-to-face is still important (Graham, 2006). However, with the rapid growth of open learning resources, blended learning can be a transition before shifting to online learning completely. Because through online learning, the transfer of information and cognitive learning can be accomplished better and faster than in traditional modes (Draves, 2001).

However, online learning is not for everyone even though education institutions offering online courses are increasing rapidly. The major pitfall of online learning is incompleteness. There are many factors which can disrupt learners' intention to complete the

course such as work, family among others. Therefore, learners need a high degree of self-discipline.

2.6.3 Teachers' beliefs and OPD

Although some studies have indicated that OPD offers opportunities to update skill and knowledge (Smith, Clark, & Blomeyer, 2005) and Pajares (1992) mentioned that beliefs are the best indicators for decision making, and as teachers choose online learning according to their convenience in terms of time, place and availability (Clary & Wandersee, 2009), there is definitely a need to go further into teachers' beliefs about OPD. Attack (2003) found that the convenience and flexibility offered in OPD depend on the ability of the participant to develop self-learning habits. In a qualitative study, Korhonen and Lammintakanen (2005) further added that learning in an online environment in terms of flexibility and convenience was related to participants' adequate access to a computer both at home and at work. This can be understood to be their knowledge about online learning, which in this study will be considered as conscious beliefs. They tend to feel that as online learning can happen at any time and anywhere using ubiquitous devices such as mobile phones, so their learning experiences will be easier, as Schommer (1998) stated, adults' working and learning are affected by their beliefs and are related.

A change in teachers' beliefs is required (Hixon & Buckenmeyer, 2009) for them to follow OPD programmes and benefit from these programmes. Education reform will only be possible when teachers are ready to alter their traditional practices and develop new constructivist teaching strategies (Borko, 2004). Their readiness is related to their beliefs about their actual traditional practices and teaching strategies. Therefore, it is important to understand how teachers' beliefs are shaped and transformed if they are to engage in OPD. More and more teachers, especially those mid-way through their careers, have become aware of their deficiencies in coping with ICT and have expressed the need for professional development programmes which are effective. These programmes will enable them to explore and discover the digital pedagogies. Pajares (1992) mentioned that "beliefs are the best indicators of the decisions individuals make throughout their lives" (p. 307), and highlighted that teachers' beliefs are related to their planning, instructional decisions and classroom practices. Teachers' beliefs are considered to be even more significant than

teachers' knowledge (Pajares, 1992). Teachers hold beliefs about their work, their subject matter, their students, and their roles and responsibilities (Kuzborska, 2011). So, teachers must be made aware in peer and group discussions as these beliefs occur consciously and unconsciously.

Using the UTAUT model and teacher learning model, this study places itself in the area where there are no extensive studies and where there is still a need for exploration. This study also adds another dimension to studies which used UTAUT, as applied to the Mauritian culture. It has a cultural diversity composed of descendants of European, mostly French, British, African slaves, Indian labourers and Chinese traders. The most spoken language is the Mauritian Creole; government and administrative work is in English and the press uses French. At school most of the subjects are taught in English, except French and Asian languages. Mauritius being a developing country, technology has to be imported compared to developed countries which produce their own. Also, there is no distinction between rural or urban schools in the local context. Students with different economic backgrounds can attend the same school. Teachers living in rural areas can work in schools found in urban area and vice versa. In this study, UTAUT will be associated to Fishman's teacher learning model to explore teachers' beliefs about online professional development.

2.7 Synthesis

To summarise, four gaps have been identified in the existing literature: (1) no previous studies were located on teachers' beliefs about online professional development in the Mauritian context; (2) gender differences in teachers' beliefs about online professional development were not effectively addressed in previous studies; (3) no previous studies done on teachers' beliefs about online professional development focused on specific subjects such as Mathematics, Chemistry, Physics, Biology and English Language; and (4) most research in the field of online education has concentrated on financial, technical, and administrative aspects (Coates, 2006). Concerning the first gap, the studies take place in large countries. This demonstrates that it is necessary to conduct studies regarding teachers' beliefs about online professional development in smaller countries. Schrum (1995) and Wiesenmayer and Koul (1999) are examples of studies which were about in-service teachers in the US context. Being in rural and remote areas, the respondents in the Herrington and Herrington (2006)

study were Australian professionals. This chapter has also shown that teachers have different types of beliefs about online professional development and that there are diverse models of online professional development. Indeed, some of these beliefs are not easy to change because they are rooted in the teachers' working experiences.

There is also a lack of vigorous analyses of profiles of participants who successfully completed online professional development programmes (Stes, De Maeyer, Gijbels, & Van Petegem, 2012) as online professional development is already a reality. In their study, Rienties, Brouwer, and Lygo-Baker (2013) confirmed this, and they wanted to see whether the learners who finished the online professional development module successfully, had different teacher beliefs, intentions and TPCK scores at the start of the course. These learners spend on average 4 hours and 59 minutes weekly to attend and/or watch videoconferencing meetings on the web. Darling-Hammond et al. (2009) found that PD must be intensive and lasted from 30 to 100 hours expand up to one year, for it to be effective. If their teacher beliefs, intentions and TPCK scores are low, they are more likely to withdraw from the course.

CHAPTER THREE: CONCEPTUAL FRAMEWORK

3.1 Introduction

The preceding chapter focused on traditional teacher professional development, the evolution of teacher PD, and OPD as an innovative direction in teacher education programmes. It also explored literature about how beliefs of teachers influence the way teachers respond to professional development programmes focusing mainly on teachers' beliefs about OPD. This chapter describes the theories linked to the acceptance of technology in an educational setting and relevant models related to teacher professional development. This chapter consists of two sections; **section one** describes the Unified Theory of and UTAUT model, and **section two** considers the model of teacher learning.

3.2 The UTAUT model

The UTAUT model has been validated in numerous studies in different contexts since 2003 and was introduced in the educational field in 2010 (Khechine, Lakhal, Pascot, & Bytha, 2014). Previously most teachers followed training courses using the traditional approach through lecturing or distance learning using handouts. Nowadays, teachers have access to the internet which offers option of following training courses online. Therefore, teachers' beliefs about online learning have to be studied. UTAUT identifies the key factors that influence the intention of accepting technology as measured by behavioural intention to use and the actual usage of technology. Ajzen et al. (1986) attested that beliefs influence behaviours. Other researchers claimed that teachers' beliefs are reflected by certain behaviours, as beliefs affect teachers' practices and decision making (Kane, Sandretto, & Heath, 2002; Ng, Nicholas & Williams, 2010). The researchers also stressed the point that teachers' behaviours do not change without alterations in beliefs. Thus, the behavioural intention to use and current usage of technology of teachers is influenced by their beliefs. The Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi and Warshaw, 1989) and TAM 2 (TAM extension) can predict successful technology adoption only to 30% and 40% of the time respectively. UTAUT has merged 32 variables found in eight existing models, namely: Motivational Model (MM) (Davis, Bagozzi and Warshaw, 1992), Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA) (Fishbein and

Ajzen, 1975), The theory of Planned Behaviour (TPB) (Ajzen, 1991), Combined TAM and TPB (CTAM-TPB) (Taylor and Todd 1995), Model of PC utilisation (MPCU) (Thompson, Higgins & Howell 1991; Triandis 1977), Innovation Diffusion Theory (IDT) (Rogers, 1995), and Social Cognitive Theory (Bandura 1986; Compeau & Higgins, 1995; Compeau, Higgins & Huff, 1999). The eight models have been reviewed and consolidated to develop UTAUT. This model increases the prediction of successful technology adoption or usage intention to 70% (Shaper & Pervan, 2007; Venkatesh et al., 2003) whereas TAM model can merely predict about 40% reliably. But later on, some researchers have found that UTAUT has lower explanatory power to explain the variance in behavioural intention, for example, 63.1% (Al-Gahtani, Hubona, & Wang, 2007), 64.5% (Wang & Shih, 2009), in 2011 Teo found that only 35.3% of the variance can be explained without interactions and 39.1% with interactions. UTAUT has been used in this study to understand teachers' beliefs about OPD usage. UTAUT identifies four important constructs acting as direct determinants of behavioural intentions and, consequently, the actual personal usage of technology. The constructs are performance expectancy, effort expectancy, social influence and facilitating conditions. There are also four control variables, gender, age, experiences and voluntariness of use (see Figure 3.1). The factor of "gender" has been removed in the framework, as gender issue will not be considered in this study

Effort expectancy (EE) is described as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450), which refers to teachers' beliefs of how much effort will be needed to use technology for TPD. The effort expectancy is also affected by teachers' attitudes towards technology to enhance TPD. If teachers have negative attitudes towards OPD, they are very unlikely to engage in such learning activities. But this tends to occur only at the initial stage of OPD adoption and become less salient at a later stage. According to Abu-al-Aish and Love (2013) as users gain experience over time their perceptions change. Studies have shown a more positive influence of effort expectancy on behavioural intention in general (Im et al., 2011; Jairak et al., 2009; Nassuora, 2012).

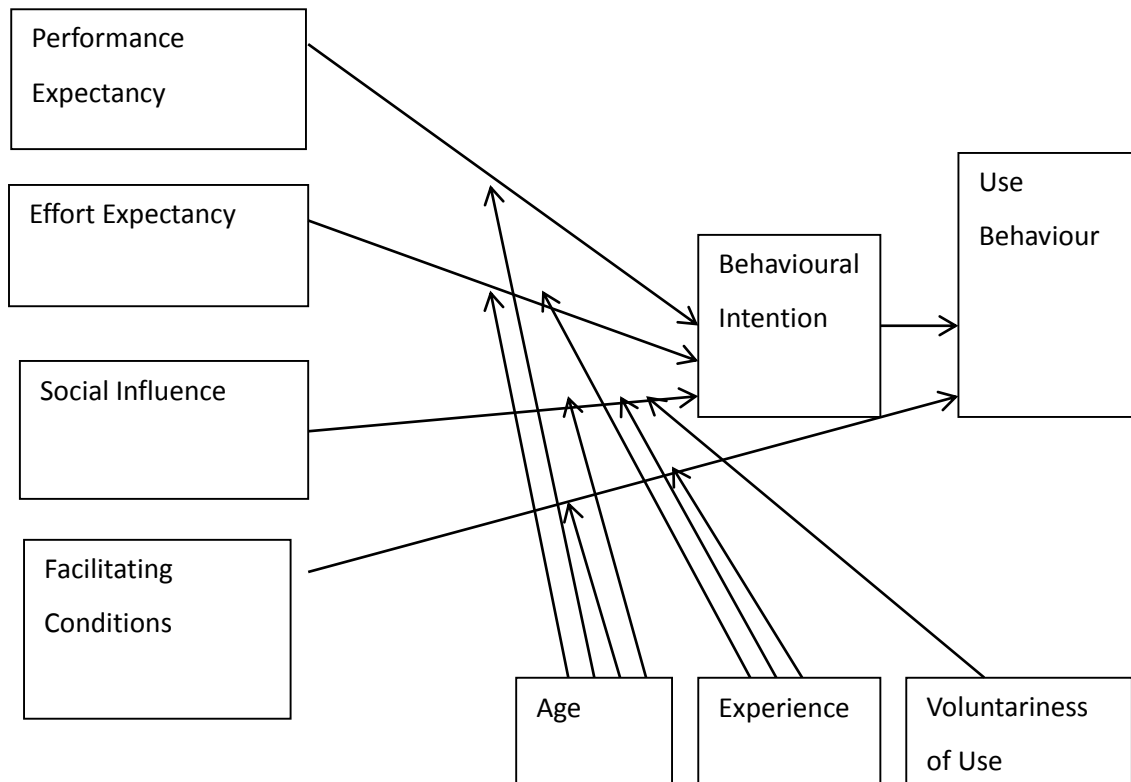


Figure 3.1: UTAUT Model

Source: Venkatesh et al., 2003)

Table 3.1: Summary of UTAUT constructs and models from which they derive

Construct	Description of Perception	Similar Construct and Corresponding Models
Performance Expectancy	The degree to which an individual believes that using the system will help him or her to attain gains in job performance	Perceived usefulness (TAM/TAM2 & C-TAMTPB); - Extrinsic motivation (MM); - Relative advantage (IDT); - Job-fit (MPCU); - Outcome expectations (SCT).
Effort Expectancy	The degree of ease associated with the use of the system.	-Perceived ease of use (TAM/TAM2); - Complexity (MPCU); - Ease of use (IDT).
Social Influence	The degree to which an individual perceives that important others believe he or she should use the new systems.	-Subjective norms (TRA, TAM2, TPB/DTPB and C-TAM-TPB); - Social factors (MPCU); - Image (IDT).
Facilitating Conditions	Refer to consumers' perceptions of the resources and support available to perform a behaviour Venkatesh et al. (2003).	-Perceived behavioural control (TPB/DTPB, C-TAM-TPB); -Facilitating conditions (MPCU); - Compatibility (IDT).

Table 3.1 provides a brief summary of each UTAUT construct, with a summary and the model from which each construct was derived. It also provides evidence of similarities among some of the models combined to form the UTAUT model (Attuquayefio & Addo, 2014). For example, an improvement of TRA and TAM resulted in TPB and these were combined to form C-TAM-TPB (Taylor & Todd, 1995). C-TAM-TPB is similar to TAM, but offers additional factors which are subjective norm and perceived behaviour control. These factors are not in TAM (Ajzen & Brown, 1991). But the prediction of ICT usage is better with TAM than C-TAM-TPB (Attuquayefio & Addo, 2014).

The study explored the effect of the different constructs on the behavioural intention of secondary teachers towards online professional development. Three constructs have been selected from the model of UTAUT (social influence, performance expectancy, facilitating conditions) and another three constructs (content knowledge, strategies, and media) from the

teacher learning model. Effort expectancy from the UTAUT model has not been considered as it occurs only at the early stage of OPD adoption and will become less salient at a later stage. Moreover, in their research, Zhou et al. (2010) and Yu (2012) were unable to find the link concerning EE and behavioural intention (BI).

Many models and theories have recently been used to outline the link among user's beliefs and BIs to use the technology, for example innovation diffusion theory (IDT), TRA, TPB, the motivational model, TAM and a hybrid model merging constructs from TPB and TAM (Venkatesh et al., 2012; Yi et al., 2006; Yousafzai, 2012), the model of perceived credibility (PC) utilisation, the social cognitive theory. UTAUT is an evaluation and combination of these models. The rationale for including UTAUT as part of the study's conceptual framework is that it has confirmed to be a valid research instrument and tool that can predict adoption behaviour and BI with importance on performance expectancy (PE) and voluntariness which are the most important drivers of technology acceptance (Al-Qeisi, 2009). UTAUT has been used in many fields such as forestry, education, banking, tourism, large organisations and business environments. Consequently, due to its simplicity and robustness, it has become one of the most widely used models (Foon & Fah, 2011; Tarhini et al., 2015; Venkatesh et al., 2012). But UTAUT has to be tested in numerous environments to consolidate its empirical basis. On the other hand, UTAUT has limitations. The initial UTAUT model focuses on large organisations, thus limiting its explanatory power. UTAUT's constructs would probably be not enough for explaining user's new technology acceptance in a non-profit organisation. Thus, more studies using UTAUT need to be carried out, especially in developing countries.

3.2.1 How do “facilitating conditions” predict teachers’ beliefs about OPD?

Facilitating conditions (FC) refer to conditions that the users consider to exist as support in using the technology (Venkatesh et al., 2003), such as training, technical support, instructor or peer support and any additional resources. Teachers will move towards OPD if the facilitating conditions are present mostly at their workplace. For example, the school must be equipped with Wi-Fi and also provide technical support whenever required.

3.2.2 How is “performance expectancy” a factor in predicting teachers’ beliefs about OPD?

PE focuses on the belief that the usage of OPD will help to boost teachers’ work. Teachers’ beliefs can to an extent be classified in terms of gender or age groups, and this construct has been described as the most powerful in predicting behavioural intention in UTAUT. How teachers perceive the technology will directly influence their performance expectancy as teachers make meaning about innovations according to their personal beliefs (Pajares, 1992). Therefore, teachers will tend to accept innovations such as OPD, which are linked to their own conceptions about PD also about teaching and learning. The content of OPD must provide opportunities to enhance teaching and learning in the teacher’s classroom so that the teacher believes in the performance expectancy of OPD.

3.2.3 How is “social influence” a factor in predicting teachers’ beliefs about OPD?

Social influence denotes the degree to which an individual perceives as important that others (such as line managers, peers) believe that he or she should use OTPD. This has a direct influence on behavioural intention. Positive social influences will positively impact on their behavioural intention to use technology for TPD. This construct shapes teachers’ intention to use new technology. As teachers normally work in isolation, despite modern trends to teach collaboratively or in teams, it will be difficult to share, for example, their technical problems with regard to technology as they fear being judged by their superiors or peers.

3.2.4 How is “effort expectancy” a factor in predicting teachers’ beliefs about OPD?

Effort expectancy refers to the simplicity of using a system, in our case online professional development programmes. This construct directly influences teachers’ BI to use OPD. Thus, the lesser the complexity of the system, the higher will be teachers’ behavioural intention to use OPD. The instructions need to be able to be easily understood and readily available. The link to the resources must be able to be accessed through a single click on the screen to ensure the ease of use. Therefore, teachers’ intention to use OPD will increase.

3.3 Model of teacher learning

The research was also based on teacher learning model (Fishman et al., 2003) as UTAUT does not cater for PD activities and knowledge. The researcher has chosen this model as professional development changes teachers' beliefs, attitudes and knowledge which affect classroom practices (Fishman, Marx, Best & Tal, 2003). In Guskey's (2002) model it is considered that student learning outcomes bring changes in teachers' beliefs, knowledge and attitudes, resulting in changing classroom practices. Moreover, the teacher learning model considers the design of the professional development as well. Fishman and colleagues maintained that teacher professional development must basically be around teacher learning: changes in the beliefs, attitudes and knowledge that teachers hold that lead to the acquisition of new processes, up-to-date skills and latest concepts associated to the teaching profession. It has also been noted that measuring teacher learning in professional development may be the most difficult thing. According to Richardson (1996) nurturing changes in teachers' classroom practices in terms of attitudes, knowledge and beliefs should be the main goal of professional development. Fishman et al. (2003) argue that designers of PD have control over three elements of PD: the media used, the site for professional development and the strategies employed. Table 3.2 shows how the four elements are applied in the designing of professional development programmes.

Table 3.2: Design elements that comprise professional development programmes

Content	Strategies	Media	Sites
Content Knowledge (CK)	Planning assistance	Print	Summer institute
Pedagogical Content Knowledge (PCK)	Tutoring	Video	Saturday workshops
Fostering meaning making for students	Examine student work	Face to face discussion	In-class support
Contextualization	Examine teacher practice	Audio	Visits to other classrooms
Fostering collaboration	Examine teaching models		Educative curriculum
Fostering discourse	Creation of professional learning goals		Graduate extension course

Content	Strategies	Media	Sites
Facilitating scientific processes	Curriculum/software review		Online support materials
Facilitating technology use	Enactment of curriculum		
	Peer information exchange		

Source: Fishman et al. (2001)

(Note that the lists in the table are intended to be suggestive, not exhaustive)

The model caters for PD even though it is called model of teacher learning. Fishman et al. (2003) pointed out that “professional development should fundamentally be about teacher learning” (p. 645). They have represented knowledge, beliefs and attitudes (K/B/A) in seven groups, namely pedagogical knowledge (PK), content knowledge (CK), and pedagogical content knowledge (PCK) based on Shulman’s works (1986, 1987); beliefs about self-efficacy (Dwyer, Ringstaff, & Sandholtz, 1991; Riggs & Enochs, 1990) of learning in online teacher professional development programmes; attitudes towards technology (Lumpe, Haney & Czerniak, 1998); and beliefs about system norms and background concerns that affect novelty (Cohen, 1987) such as online professional development for teachers.

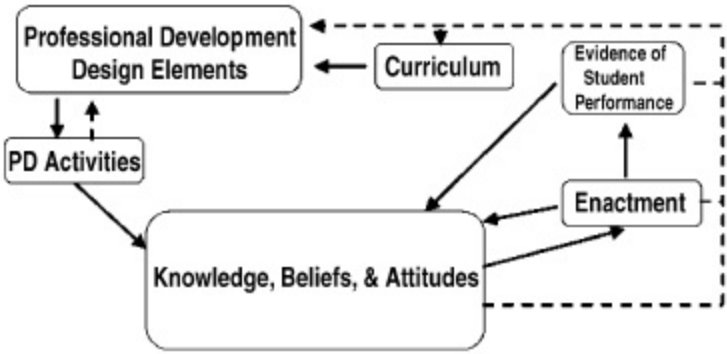


Figure 3.2: Model of teacher learning

Source: Fishman et al. (2003, p. 645)

The PCK refers to the content that teachers expect to obtain when participating in the PD programme. They need to learn the content; this is why attending PD programmes is

considered to be necessary for teachers (Joubert & Sutherland, 2009). Teachers' needs will be the content of the OPD. Strategies refer to how teachers intend to learn the content in this technology-mediated study. The site is the physical environment where the PD programmes will take place: in this case, online. The media through which the PD would be delivered would be affected by site and the strategies.

Institutions have to provide adequate PD (Ebert-May et al., 2011; Löfström et al., 2008; Rienties et al., 2011; Rienties et al., 2012) to cope with new learning environments and diverse students (Alvarez et al., 2009; Rienties et al., 2012; Volman, 2005). If PD is embedded into teachers' everyday practices, it is more likely to impact on teachers' beliefs (Lawless et al., 2007; Rienties et al., 2011; Stes et al., 2010; Stes et al., 2011). Thus, teachers' beliefs about OPD might change if their knowledge acquired during OPD has an influence on their classroom practices. Teachers' beliefs are in accordance with classroom practices (Savasci-Acikalin, 2009). In this study, the teacher learning model (Fishman et al., 2003) will assess how the content, strategies, site and media influenced teachers' beliefs about OPD in a learning context as these beliefs may influence their classroom practices, knowledge and the way they will learn the content. Vo et al. (2010) attest that successful teacher PD is required for the best student outcomes. Student learning outcomes are the determining factor in stimulating change in teacher's beliefs (Guskey, 1986, 1997, 2002). Change in teacher is equal to enactment in Fishman's model, and student learning outcome is student performance.

Curriculum shapes teachers' professional development and is moulded by the outcomes of this PD. The core innovation is formed by the design of the curriculum that helps teachers to acquire skills to enact through professional development (Fishman et al., 2003). What seems to be included in the curriculum is guided by an amalgam of elements such as state standards, teachers' ability to interact with the curriculum and the performance of students (Fishman et al., 2003). Ball and Cohen (1996) add that the materials of the curriculum are intentionally created to be "educative" for teachers, thus offering them with possibilities to learn innovative teaching practices for content delivery and class management (Fishman et al., 2003). Thus, curriculum plays a vital part in teacher learning models.

While professional development design elements focus on the content to prepare teachers to enact the curriculum properly and apply the activity in classroom situations, teacher learning activity must be related to the preparation of instruction as well as the instructional activities themselves. Media, sites, strategies, media and content are the four components that can be joined in different combinations to form professional development. The design space for professional development is possible through the different combinations of these elements, thus forming a wide variety of options which have the possibility to be explored in the design research process. The design is likely to cater for all the change mechanisms that affect K/B/A. Thus, before attempting the innovation, each teacher has to acquire a required threshold regarding each of these amended mechanisms. The learning of the content is enabled by a variety of approaches and is delivered through diverse media that are part of the sites where the professional development programme is occurring. When professional development activity is combined with the elements in Table 3.2, this brings changes in teachers' knowledge, attitudes and beliefs. The inter-related relationship between each of these factors and the content for professional learning is shown in Table 3.2.

3.3.1 Exploring the concept “pedagogical content” of professional development

Fishman and colleagues (2003) have divided the content of professional learning into two categories. The first is OPD that provides possibilities for teachers' understanding of the content for preparing the classroom instructions. These include activities that promote planning strategies; new ways of assessing students; and knowledge of subject matter that is connected to teaching approaches (PCK). The second is related to the actual classroom instructions that teachers must know. This content would help teachers to foster meaning making for students; create contextualisation opportunities; cultivate collaboration; foster discourse; facilitate scientific practices, include the use of tools, representations and modelling, technologies, the curriculum content, and elementary pedagogical knowledge like classroom management. So, if these two categories of pedagogical content are integrated in OPD, and if teachers are provided with support when required, this may encourage teachers to participate in professional development programmes with the adequate goals, which are to acquire PCK and be able to change classroom practices.

3.3.2 Strategies employed in teacher learning

Several strategies used to nurture teacher learning are derived from enactment of new practices in classrooms; collaborative construction of understanding; reflection on practice; and adaptation of materials and practices together with the collaborative construction of understanding; enactment of new practices in classrooms; reflection on practice; and adaptation of materials and practices (CERA) framework that is used to conceptualise our individual professional development (Marx, Blumenfeld, Krajcik, & Soloway, 1997; Marx, Freeman, Krajcik & Blumenfeld, 1997). CERA can offer a general environment where policy decision makers, management, innovation designers, including curriculum developers, specialists who designed and enacted professional learning tasks and teachers engaging in professional development programmes can collaborate. OPD should provide such strategies that facilitate exchange of information, so that all stakeholders can benefit from it.

3.3.3 The concept “site” as explained by Fishman et al.

The site is just the place or context where professional learning – in our case teacher learning – may take place. A site uses different methods that fit its context. The media used through which the learning is disseminated are determined by the site. Thus, the content will differ according to the teachers’ needs in a given context. Summer workshops, after-school in-service sessions, graduate-level coursework related to teacher’s interests and teacher enactment of curriculum in the classroom are examples of traditional forms of professional development for teachers. In an online environment, all these can happen at any time and anywhere, teachers can share their views, works and comments at any time, thus not needing to wait for summer workshops, for example.

3.3.4 The use of media in teacher learning

Media is the mode through which PD may be conducted. The media can be print, audio, video; face-to-face interaction or technology-based (online). There are diverse combinations of media: for example, face-to-face can be mixed with video, or an interactive PowerPoint presentation. The internet can also be part of media which includes multimedia to deliver professional learning. In the context of OPD in this study, teachers’ beliefs about

media are very important as we are living in a digital world where knowledge is available at our finger-tips.

Since teachers' beliefs do influence their intention and actual use of some new technology, the study is underpinned in part by the UTAUT (Venkatesh et al., 2003) and also by the model of teacher learning espoused by Fishman et al. (2003).

3.3.5 Synthesis

In this chapter, the description and the relevance of the two theoretical frameworks to this study have been discussed. It started with a discussion of the UTAUT, the technology acceptance model which has been considered by mostly positivist epistemology and teacher learning model. The UTAUT model has increased the prediction of the adoption of technology to 70% compared to TAM which is about 40%. But still, there was no common agreement about prediction technology adoption using the UTAUT model. Other researchers have subsequently found that the prediction was lower than 70%. For example, Teo (2011) found that only 35.3% of technology adoption can be predicted using UTAUT. A combination of UTAUT model and teacher learning has been proposed as a new conceptual framework for guiding the research as shown in Figure 3.3. So content, strategies, site and media regarding teachers' learning model, would help in exploring how teachers' beliefs about online professional development are influenced. Thus, more research needs to be carried out to improve the conceptual framework for predicting technology adoption.

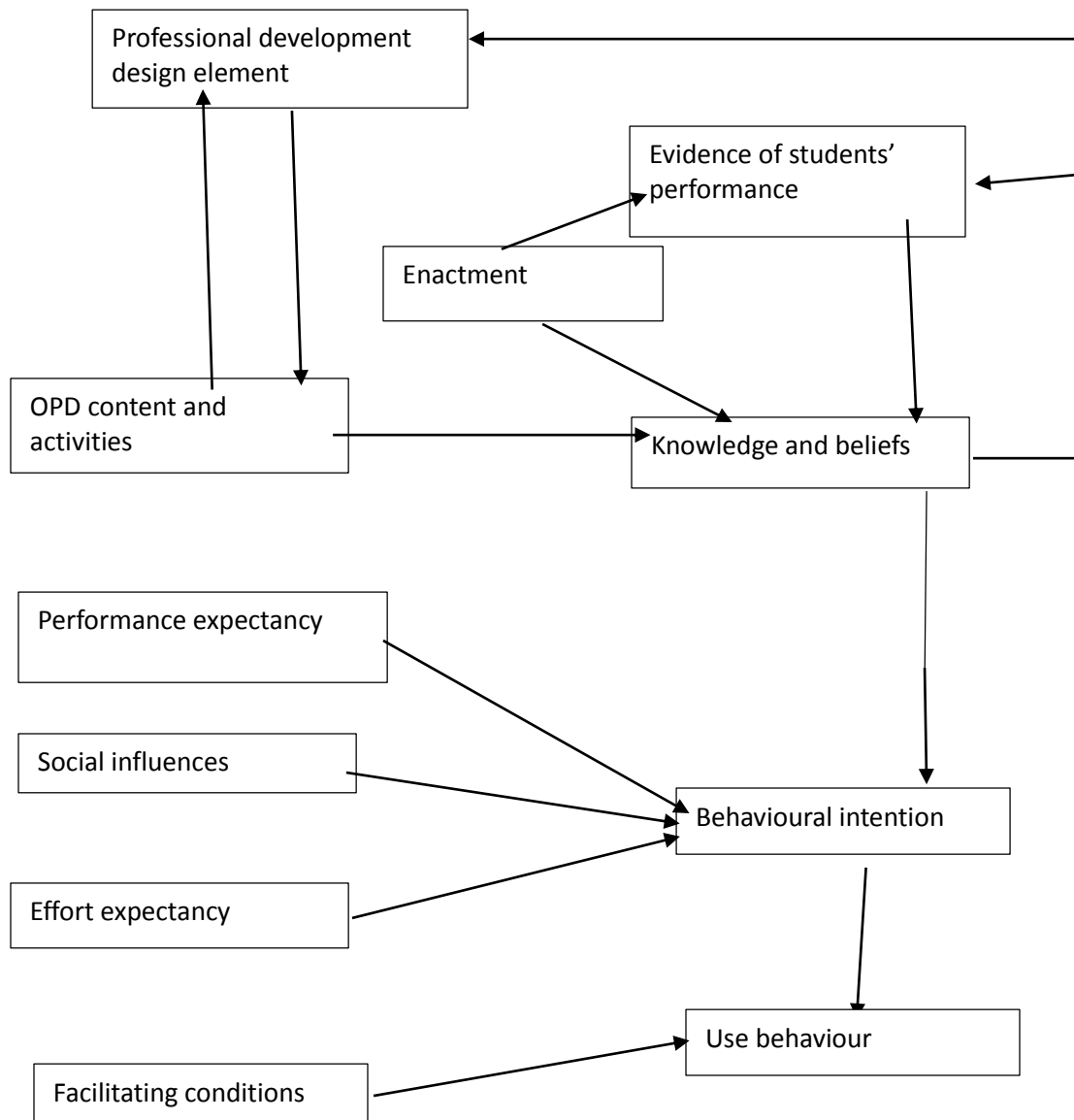


Figure 3.3: The proposed conceptual framework for the study

In Figure 3.3, PE, SI, EE and PC have the same meaning as in the UTAUT model. PE, SI and EE influence teachers' behavioural intention to OPD. FC influences the usage of OPD. Professional development design element is influenced by the content and activities available in the PD programmes, the curriculum to be covered and teachers' knowledge and beliefs. The knowledge and beliefs that teachers hold about OPD will influence their behavioural intention to use OPD, which is why they are linked in the proposed conceptual

framework. Ajzen and Fishbein (2005) claim that behavioural intentions are thoughts resulting from beliefs. So if teachers have adequate knowledge and positive beliefs about OPD, this will positively influence their behavioural intention to use OPD.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

The previous chapter described the theories used to create the conceptual framework that guided the research; this chapter describes the route followed in conducting the study. The chapter consists of seven sections in which details relating to the research design and methodology are spelt out. **Section one** is an introduction to research design. **Section two** deals with the paradigm used in the research, and the reasons for choosing the interpretive paradigm. **Section three** describes the research approach used in the study that is the mixed methods. It gives an overview of the reasons for choosing mixed methods, the limitations of mixed methods and also the researcher's role. **Section four** describes the qualitative approach of this study. **Section five** explains the quantitative approach of the study. **Section six** covers the part describing how the researcher took into account the factors of ethics, validity and reliability in the study. It also deals with the limitations of the study. **Section seven** is a synthesis of the chapter.

4.2 Purpose of study, research questions and objectives

This study addresses the beliefs of secondary school teachers about online professional development. The study is about exploring secondary teachers' beliefs about online professional development. It focuses on both award and non-award OPD programmes in the context of secondary teachers' professional growth. Both types of programmes are considered to obtain a deep understanding of teachers' beliefs in OPD. To guide the research the following questions are considered:

1. What are the secondary school teachers' beliefs about OPD and why do they have such beliefs?
2. What are the facilitating and inhibiting factors that influence secondary school teachers' beliefs about OPD?
3. How are secondary school teachers' beliefs about OPD constructed?
4. What model can be developed to explain the participation of secondary school teachers in OPD?

4.3 Research paradigm

There are different definitions for the term paradigm. For Denzin and Lincoln (2005) paradigm is like “the net that contains the researcher’s epistemological, ontological, and methodological premises” (p. 22). Mertens (2005), on the other hand, sees it as “a way of looking at the world. It is composed of certain philosophical assumptions that guide and direct thinking and action” (p. 7). Neuman (2006) describes paradigm as “a general organizing framework for theory and research that includes basic assumptions, key issues, models of quality research, and methods for seeking answers” (p. 81). Therefore it is vital for a researcher to indicate in which paradigm he or she is operating.

This section describes the need to place this study within a philosophical paradigm, namely the interpretive paradigm. This part is designed to explore the beliefs and experiences of secondary school teachers about online professional development. Qualitative researchers study human action in its natural setting (Babbie & Mouton, 2001; Creswell, 1998; Eisner, 1998; Moustakas, 1994). In this study, the researcher has attempted to understand the experiences and beliefs of teachers about OPD and the results from the qualitative phase have been used to construct a survey instrument for the quantitative phase. Reddy (2010) argues that social issues link with the way people interact with each other in the society, the way they learn using resources such as technology and how they are organised around social institutions and share some mutual interest can be explored qualitatively.

The interpretive paradigm emphasises the importance of participants’ views, the context and the meaning participants hold regarding issues (Creswell, 2005) like teachers’ beliefs about OPD. The interpretive view takes into consideration the different contexts, experiences, knowledge and beliefs of the participants in the research and that the environment may influence human behaviours which act on human beliefs (Creswell, 1998; Denzin & Lincoln, 2000; Patton, 2002; Tesch, 1990). In interpretive research, meanings are socially constructed through individuals’ interactions with the environment; also there are multi-constructions and interpretations of reality that are changing with time (Creswell, 2005; Patton, 2002; Struwig & Stead, 2001). The interpretive approach is based on an ontology where there is a subjectivity of reality, a product which is socially constructed and interpreted by humans as social agents according to their beliefs and value systems (Darke

et al., 1998). While adopting an interpretive paradigm the researcher learnt and explored how individuals experience and interact with their social world and how they construct meaning (Creswell, 2005; Patton, 2002; Struwig & Stead, 2001). This study explored teachers' experiences and beliefs about OPD. The study provides a deep understanding of the 'real world' through meaning making based on the participants' cultural and historical context (Orlikowski & Baroudi, 1991) and acknowledges the researcher's own subjectivity as part of the process (Lawrence, 2002). In this approach, the participants are allowed to use their word or image to derive their own concepts and experiences. From an epistemological perspective, truth is constructed from the researcher's and the respondents' beliefs of how we understand the world. Furthermore, in an interpretive approach the researcher allows themes to emerge from the field. It is also appropriate as it is suitable for the generation of valid interpretive knowledge. Terre Blanche, Durrheim, and Painter (2006) advocated the following notion about interpretivist paradigm:

“The interpretive paradigm involves taking people's subjective experiences seriously as the essence of what is real for them (ontology), making sense of people's experiences by interacting with them and listening carefully to what they tell us (epistemology), and making use of qualitative research techniques to collect and analyse information (methodology)” (p. 120).

As the study is concerned with the beliefs of teachers towards online professional development in a complex social context, the interpretive approach is deemed appropriate. All the assumptions concerning the interpretive approach have been taken into consideration. As opposed to other approaches, it is more appropriate to understand a complex phenomenon, like beliefs. It is concerned with the understanding of the participants' experiences involved in the study. The description, analysis, interpretation, and understanding of beliefs and the actual or future usage of online professional development from teachers' perspectives in this study are the major goals of the study. Also, given that beliefs are dynamic and social phenomena, the researcher needs a proper approach to help in the understanding of the complex interactions within their natural setting. The interpretivist researcher tries to deeply understand the phenomena being studied. Additionally, the participants are allowed to use their individual wording and imagination, and to develop their ideas and experiences in this approach. The researcher subscribes to what other researchers state about reality, that is, it

is socially constructed (Burrell & Morgan, 1979). As Strauss and Corbin (1998) mention, all the emerging categories were grounded in the data collected, and the researcher has avoided adding externally defined categories in the study.

4.4 Research design

The research design is the strategy, the protocol or the organised framework that the researcher uses as guidelines to conduct the research process so as to answer the critical questions (Babbie & Mouton, 2001; Neuman; 2006). Therefore, research design describes the nature and steps the research intends to follow, comprising the part of research methodology, approach and methods and techniques (Creswell, 1998). Findings' validity has been pushed to the maximum, thanks to the frame and planning of the study (Denzin & Lincoln, 2005). Therefore, the researcher must make important decisions while developing the research design, precisely issues concerning the purpose of this study, the theoretical paradigm that informed the research, the background in which the study is carried out, and lastly the approaches of collecting and analysing the data (Mouton, 2001).

4.4.1 Philosophical and historical foundations of mixed-methods research

Researchers using the mixed-methods approach have to discuss the philosophical foundations of this methodology at the start of the mixed-methods research (Creswell & Plano Clark, 2007) as mixed-methods research is relatively new compared to research which is rooted in purely qualitative, or otherwise quantitative approaches. Creswell and Plano Clark (2007) stress the point that mixed-method approach comprises philosophical norms that direct the collection of data and analysis qualitatively and quantitatively. Therefore, it is imperative to provide a short summary of the philosophical assumptions.

Positivism is a scientific philosophy with the objective of verifying the data collection method using statistical procedures in explaining, predicting and controlling the phenomena. It was a philosophy that dominated research until the late nineteenth century (Onwuegbuzie, 2000). In that period positivists claimed that reality was independent of the observer. So, the observer can remove him- or herself from the existing phenomena objectively. Social scientists started to question the quantitative approach as the only scientific method used to understand social issues in the twentieth century.

In the period from 1959 to 1976, mixing methods was accepted as a means of data triangulation by the social sciences community. It was Campbell and Fiske (1959) who initially present data triangulation as a basis of several methods, and it was later adopted by many studies (Creswell, 2009; Creswell & Plano Clark 2007, Greene, 2007). Researchers started to mix surveys and interviews and lastly, qualitative and quantitative methods later in that period.

4.4.2 Reason for choosing mixed methods

The purpose of using mixed methods is that the use of a combination of qualitative and quantitative approaches may offer a better understanding of complex phenomena and research problems than either approach alone (Creswell & Plano Clark, 2007). Mixed methods are used to offer a more complete understanding of teachers' beliefs in OPD than either the quantitative or the qualitative method alone. Thus, teachers' beliefs are viewed from multiple perspectives. The mixed-methods approach enables the use of both the qualitative and quantitative approach. The rapid evolution of technology makes it an integral part of the individual's life, but existing theories and findings do not explain the phenomenon sufficiently (Venkatesh, Brown, & Bala, 2013). Therefore, mixed methods can provide strategies to help researchers to explore and understand the phenomenon and as a result, contribute to theory. This approach is suitable because it allows the preliminary qualitative exploration of the research phenomenon in a small sample to get greater insight into the research situation, collecting information for developing a measuring instrument and analysing the research topic through two complementary methods rather than competing methods (Bergman, 2008; Creswell & Plano Clack, 2011; Flick, 2008). The aims of the researcher are to reach the situation where "blending qualitative and quantitative methods of research can produce a final product which can highlight the significant contributions of both" (Nau, 1995, p. 1), where "qualitative data can support and explicate the meaning of quantitative research" (Jayaratne, 1993, p. 117). This assumption makes sure that the researcher takes full advantage of the strengths of a mixed-methods approach through the final outcome as the qualitative approach is best at making sense of participants' points of view through what is called storytelling. Mixed-methods research has the capacity to solve exploratory research questions (Teddlie & Tashakkori 2003; 2009).

Thus, for exploring the beliefs of secondary school teachers about online professional development which involves cognitive and behavioural attitudes, to analyse participants' points of view, a qualitative approach is suitable to explore these facets. Using a qualitative approach allows the researcher to develop theories that may emerge. It assists the researcher to unfold the phenomenon in more detail so that an overall picture of the phenomenon being studied can be constructed. However, it is difficult to predict the impact of the generalisability of themes. For instance, new insights and modes of analysis can be reached by mixing research methods (Kaplan & Duchon, 1988; Orlikowski & Baroudi, 1991).

Many researchers (Attewell & Rule, 1991; Cavaye, 1996; Gable, 1994; Kraemer & Dutton, 1991; Orlikowski & Baroudi, 1991; Wynkoop, 1992) have put forward several reasons for applying mixed methods. Primarily, it allows the construction of a broad, rich picture about a phenomenon better than each method would be capable to do on its own. Secondly, as the findings can be supported through cross-validation attained as soon as diverse categories and data sources converge and are found congruent, the strength of the results increases. Thirdly, it also helps to clarify reasons why diverging results were obtained. Fourthly, researchers can take advantage of the strengths of each while minimising the flaw built into single strategies; thereby finally, increasing the validity of the research findings. Additionally, researchers such as Denzin and Lincoln (1994) among others feel that researchers could mix elements of quantitative and qualitative paradigms at their ease or to adapt preferred parts from each the way they want to (Denzin & Lincoln, 1994; Lincoln & Guba 1985; Guba, 1990). Gable (1994) supplies two major reasons for adding quantitative survey data with qualitative case study data, firstly to create a richer context while bringing more value to the building models; and secondly to ameliorate the internal validity and interpretation of quantitative results. The main strength of a survey which contains the characteristics of generalisability or external validity can be combined with the major strength of case studies that is its complicatedness and discoverability. This can result in producing a better piece of research (Gable, 1994). In the same way, Denzin (1989) contends that the drawbacks of one method are frequently the strength of the other one; but the researcher can overcome flaws by combining the methods.

Using online technology is more about the ways it can be best put to use, how to manage it, what its effects are on the individuals and the school in the context of online PD

for teachers and the society. Online PD is both a social and a technical process. As social phenomena are complex to study, using different perspectives permits a phenomenon to be explored from diverse perspectives (Banville & Landry, 1992). Therefore, using various angles and method is laudable and valid to explore online professional development as it is part of information systems which are a pluralistic field by nature (Banville & Landry, 1992). It also allows the application of different paradigms in a research.

As the purpose of the study was descriptive as well as exploratory, the choice of mixed methods was obvious, as Robson (1993) has suggested that survey is most appropriate for descriptive research, and exploratory is most suitable for a case study. The qualitative method has been used in exploratory research to provide a deep understanding of the phenomenon (Punch, 1998; Walsham 2006), whereas the quantitative method in confirmatory research is to test theories (Venkatesh, Brown, & Bala, 2013). The mixed-methods approach can address both confirmatory and exploratory research questions at the same time (Teddlie & Tashakkori 2003, 2009). Individual voices obtained through the qualitative phase can be generalised using the quantitative data (Teddlie & Tashakkori, 2003). This research approach offers both contradictory and complementary findings that lead to a re-examination of the conceptual framework and the assumptions. It might be suitable to use mixed-methods design to address research problems in four instances, namely (a) Triangulation Design – when both qualitative and quantitative methodology are needed; (b) Embedded Design – when a second source of data is needed to enrich the study; (c) Explanatory Design – when the quantitative results needs to be explained, and (d) Exploratory Design – when the researcher first needs to explore the context qualitatively (Creswell & Plano Clark, 2007).

The emphasis of this part is not for claiming that mixed methods is the sole suitable research approach for this research. Instead, it highlights the ability of the approach to enable the understanding of the complexity linked to the beliefs of secondary school teachers about online professional development. The researcher agrees that a mixed-methods approach is more appropriate in dealing with online technological issues. So, instead of competitors, qualitative and quantitative approaches must be regarded as complements. Moreover, both exploratory (qualitative) and descriptive (quantitative) method would be used in this study. This study uses the exploratory design as described in the next section.

The potential use for selecting the mixed-method approach for this study is based on Creswell's (2003) and Creswell and Zhang's (2009) argument, which is as follows:

- a) The second quantitatively phase of the design will be used to confirm the qualitatively driven first phase conducted;
- b) To allow flexibility in its application, the mixed methods may or may not be implemented within a given theoretical perspective;
- c) Starting with the focus group and then uses analysed information to develop a survey instrument, enables the researcher to explore how individuals describe a phenomenon;
- d) The interpretation of the qualitative findings were assisted by using the quantitative data and results obtained; and
- e) The approach being in two phases renders it simple to apply and straightforward to describe and report.

4.4.3 Application of the exploratory approach

The researcher has used an exploratory sequential mixed-methods methodology design as mentioned in Chapter One. The reasons for choosing this approach are that the study primarily focuses on the development of a survey instrument to measure elements affecting teachers' intention to use OPD and also to generalise the qualitative findings to a different sample. The explanatory sequential mixed-methods focus on explaining quantitative results by exploring some results in more detail or explains unexpected results. The purpose of an explanatory approach is to describe or construct upon the starting quantitative results using qualitative data (Creswell, Plano Clark, 2003). It is appropriate in a study where the researcher needs qualitative data to explain outlier or surprising results (Morse, 1991).

In this approach, the qualitative and quantitative phases take place in turns in a sequential way (Delpont & Fouché, 2011). Data have been collected, analysed and mixed from two separate research phases namely qualitative and quantitative approaches. This approach provided the opportunity to discover meanings of teachers' beliefs about OPD and realities of why teachers have such beliefs about OPD in the research context. A researcher might use the exploratory design when there is a need to explore the context qualitatively

first (Creswell & Plano Clark, 2007). The adoption of exploratory design is best suited when there is a need to explore the phenomenon first (Creswell & Clark, 2010; Tashakkori & Teddlie, 1998). This design is suitable when “measures or instruments are not available, the variables are unknown, or there is no guiding framework or theory” (p. 75). This approach intends to use the qualitative results to develop a quantitative instrument. Thus data collection happens in two phases. The exploratory design is suitable especially when the instrument is not available, and thus needs to be developed and tested, and also to identify variables to be studied quantitatively (Creswell & Plano Clark, 2007). Specific items (quotes, codes and themes) were created from the dimensions which were explored qualitatively. Then, these items were used to produce the constructs used in the conceptual framework for phase two. The participants’ quotes were used to support the explanation of the emerging themes. In phase two the codes, themes and statement from the qualitative data were used to create the questionnaire items. The questionnaire was administered to a larger sample after reliability and validity test had been done. The purpose is to see if the quantitative results were in line with the findings from the qualitative approach and what relationship could be made among the variables. The researcher has used the same timing as Fitzpatrick (2008), in which data collected and qualitatively analysed first. Then a survey instrument was produced from the qualitative findings for the collection of data in the quantitative approach. Both datasets were merged in the interpretation stage.

In phase one of the study, the secondary school teachers’ beliefs were explored qualitatively by collecting teachers’ views through a focus group in Maya secondary school. The second quantitative phase has been carried out for generalisability of the findings. In the quantitative approach, the survey method (questionnaire) was used for collecting data from teachers from two secondary schools. From the data obtained from the instruments, variables related to beliefs that teachers have regarding the emerging OPD courses have been interpreted, associated and analysed. Quantitative research questions have been framed after the completion of the initial qualitative phase. In this study, priority has been granted to the qualitative phase. The intention of collecting qualitative data initially is to get in-depth understanding of teachers’ beliefs in OPD, ending with a model depicting teachers’ acceptance of OPD based on their beliefs and other relevant factors. The interpretive paradigm is congruent with mixed methods as it is a large family of diverse paradigms

(Burrell & Morgan, 1979). The interpretive approach offers the researcher greater possibilities to address teachers' beliefs about online professional development and ask "how" and "why" these beliefs are constructed (Deetz, 1996).

4.4.4 Data collection

An explanation of how the case study and the questionnaire were developed and how the data were collected was presented in this section. The data collection occurred in two secondary schools in two sequential phases. The aim was to offer a rich description of the phenomenon in the data gathering stage, that is, teachers' beliefs about online professional development. It is claimed that to collect data that adequately explore the beliefs of teachers about online professional development, it is always best to use various methods (Kling, 1991; Danziger & Kraemer, 1991). Each of the two selected methods for this study (focus group and questionnaire) offered the participants (teachers) a different avenue to express their beliefs and attitudes towards online professional development. Literature review was an additional source for comparison.

Using triangulation through different methods of data collection was mostly useful in generating theory, as an issue could be viewed from multiple perspectives and more insights are provided on concepts that emerged, also allowing cross-checking which leads to more robust construct validation (Glaser & Strauss, 1967; Orlikowski, 1993). Eisenhardt (1989) noted that the intersection of data collection and data analysis provides numerous benefits: "it not only gives the researcher a head start in analysis, but more importantly allows the researcher to take advantage of flexible data collection. Indeed, a key feature of theory-building case research is the freedom to make adjustments during the data collection process "(Orlikowski, 1993, p. 7).

4.4.5 The timing of the mixing methods

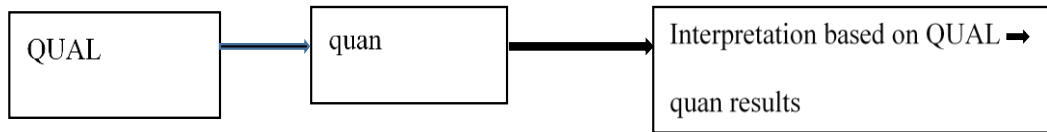


Figure 4.1: The mixed method timing

Source: Creswell and Plano Clark (2007)

The study explored the effect of the three constructs of UTAUT (SI, PE and FC) on the behavioural intention of secondary school teachers to use online professional development and also the four constructs (knowledge, beliefs, strategies, content and media) from the teacher learning model. Figure 4.1 shows how the two approaches were mixed. The uppercase shows which approach is dominant. This study comprised two data collection methods, focus group to gather qualitative data from a small group of teachers and a questionnaire to collect quantitative data from a larger group of teachers. The focus group was used to understand how these constructs influenced teachers' behavioural intention to use online professional development in depth. The goal of the questionnaire used in the quantitative approach was to find the relationship between the constructs and also as a confirmation.

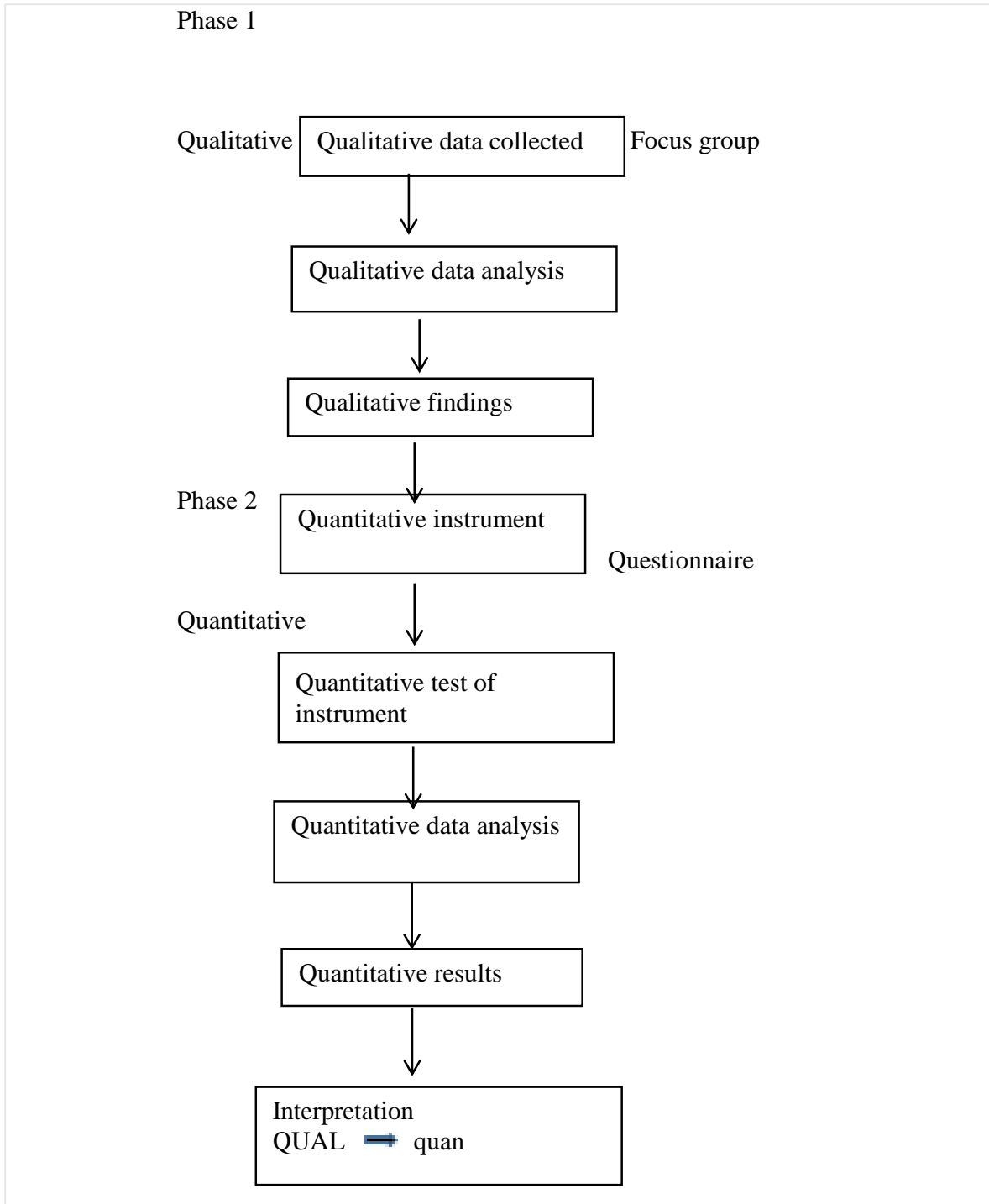


Figure 4.2: Research process

Source: Creswell & Clark (2007)

The instrument development model is used when the researcher wants to construct and apply a quantitative instrument from the qualitative findings (Creswell & Plano Clark, 2007) as shown in Figure 4.2. The topic was explored with a few participants first. Then the findings from the qualitative approach were used as guidelines to create the items and scales for the quantitative instrument. The researcher implemented and validated the instrument quantitatively during the data collection of the second phase. So through the development of the instrument, the qualitative and the quantitative approaches were connected. In this variant of exploratory sequential mixed-methods approach, the researcher lay emphasis on the qualitative aspect of the study (Creswell & Clark, 2007) as more data was collected in the qualitative approach.

4.4.6 Researcher's role

It is essential to talk over the researcher's responsibility as the "primary instrument for data collection" (Merriam, 2009, p. 15). The advantages include extending the researcher's own consideration through numerous means of communication, the capacity to process data and information instantaneously, the possibility to determine, discuss, and clarify responses with participants, and lastly the probability of leading to advance exploration of unexpected results.

The preconception and worldview of the researcher have also contributed to the creation of data collection instruments, along with the interpretation and analysis of participants' beliefs towards online PD in secondary schools. This technical knowledge about ICT enables the researcher to better formulate the questions and statements of the data collection instruments. These experiences also help the researcher to understand the phenomenon under study. On the other hand, pre-existing concepts and assumptions may act as filter and blind one from seeing the important aspects in the phenomenon. Thus, the researcher needs to accommodate a "neutrality" stance (Lincoln & Guba, 1985). Therefore, possibly the researcher's bias might influence the results making the above issues very significant (Merriam 2009). To overcome these possible problems two data collection approaches were used: the qualitative approach for phase one and the quantitative approach for phase two, to ensure reliability and validity.

4.5 Qualitative approach (phase 1)

A case study methodology was used in the first phase of this study (Creswell, 2007; Yin, 2003) to find greater understanding of the case under the lens as well as to explore the uniqueness and complexity of the context in case studies. Moreover, the case study allowed the researcher to understand the interactions of the participants within their context. “Previously unknown relationships and variables can be expected to emerge from case studies leading to a rethinking of the phenomenon being studied” (Stake, 1981). “Insights into how things get to be the way they are can be expected to result from case studies” (Stake, 1981, p. 47). According to Merriam (1998, p. 29) “particularistic, descriptive and heuristic” are characteristic qualities of case studies. Case studies which are particularistic concentrate on a specific condition, incident, phenomenon or program and “concentrate attention on the way particular groups of people confront specific problems, taking a holistic view of the situation” (p. 29). Case studies are complete as they offer a “rich, thick description of the phenomenon under study” (p. 29), and case studies are also heuristic as they “can bring about the discovery of new meanings, extend the reader’s experience, or confirm what is known” (p. 30). Qualitative researchers are concerned with meaning, that is, how people make sense of their lives, what they experience, how they interpret their experiences and how they structure their social world (Merriam 1998). Qualitative research is a form of inquiry that explores phenomena in their natural settings and uses multi-methods to interpret, understand, explain and give meaning to them (Anderson 1999). As online teacher professional development is a take-off phenomenon, an interpretivist approach is more appropriate as it can produce a rich understanding of the significant issues associated to this topic. The interpretivist paradigm helps the researcher to obtain deep and detailed descriptions of phenomena being studied in their natural environment. Thus, it was suitable for gathering human experiences and beliefs of OPD in this study. The researcher sought to understand and interpret the phenomena with respect to the meaning the participants place on them (Creswell, 2009). The use of qualitative methods assumes that reality is constructed by individuals interacting in their social worlds. The qualitative approach offered an in-depth understanding about teachers’ beliefs in OPD.

Case studies are categorised as descriptive, interpretative or evaluative as mentioned by Merriam (1998). But she further added that some case studies are only descriptive while

a lot combine description with interpretation otherwise description with evaluation. A combination of description and interpretation was used in this study as they allowed the researcher not only to describe the data but also to make conclusions beyond the data analysed.

4.5.1 Research context and sampling

The target population was secondary school teachers in Mauritius. The study site for phase 1 was one Confessional secondary schools in Mauritius. The Confessional schools are grant-aided private schools owned by a religious body. The school was chosen due to the ease of access. In Confessional schools, decisions are taken within the schools, as compared to the more complex bureaucratic procedures in state schools whereby decisions are taken by the Ministry of Education of Mauritius through the Zone Director. In addition, in state schools teachers can be transferred to another state college. But in Confessional schools, teachers remain in their initial school unless they are dismissed or resign. The school's context tends to be almost constant. Teachers in the selected Confessional school have gone through some kind of PD such as seminars, workshops and teacher-training short courses during their career. In the study I used a sequential mixed-methods sampling. A purposive sample was used for data collection in one secondary school for the first phase of the study, namely Maya secondary school (a fictitious name). Purposive sampling allows the researcher to ensure that the characteristic of participants included in the sample are defined by a set of criteria. By using purposive sampling, the researcher chooses what needs to be known and finds about the participants who are able and are keen to deliver the required data in terms of experiences and knowledge (Lewis & Sheppard, 2006). Purposive sampling can provide trustworthy and robust data despite its inherent bias (Lewis & Sheppard, 2006).

The participants were selected according to the researcher's own judgement. The participants were chosen according to their availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive and reflective manner (Bernard, 2002; Spradley, 1979). The collected data from the participants improves the validity, usefulness and knowledge produced from the sample (Patton 2002). Participants were chosen according to three categories, namely gender, qualifications and subject. Five participants were designated from each category giving rise to a total of 15

participants as shown in Table 1 in Appendix F. Three focus groups of five participants were used to attain data saturation and/or theoretical saturation. A diverse group (maximum variation sampling) of five participants was used to gain different perspectives regarding the phenomenon and for better monitoring. Furthermore, the diverse group provided multiple perspectives about the phenomenon under study (Creswell, 2007). Each participant was given enough time to express his or her views and the researcher could see who said what. Subject selection criteria for participants of the purposive sample was according to subjects taught, with the highest number of teachers, namely Mathematics and Science, Economics, French and English. Table 4.1 shows the final sample which comprised six male and nine female teachers with academic qualifications ranging from Bachelor's to Master's Degrees.

Table 4.1: Participants' profiles

Participant	Gender	Qualification	Years of experience	Subject taught	PD delivery mode
Teacher A	F	Bachelor degree (Following PGCE course)	3	Economics	Face-to-face mode
Teacher B	F	Bachelor degree (following master degree course)	3	French	Face-to-face, blended mode
Teacher C	M	Master degree	3	Economics side	Face-to-face, blended mode
Teacher D	F	Bachelor degree (following master degree course)	2	Mathematics and science	Face-to-face, online mode
Teacher E	M	Master degree	8	Mathematics and science	Face-to-face, blended mode
Teacher F	M	B. Ed	13	Economics side	Face-to-face mode
Teacher G	M	B. Ed	13	Mathematics and science	Face-to-face mode
Teacher H	F	Bachelor degree	6	English	Face-to-face, online mode
Teacher I	M	Bachelor degree	10	English and French	Face-to-face, blended mode
Teacher J	F	Bachelor degree	12	Economics sides	Face-to-face mode

Participant	Gender	Qualification	Years of experience	Subject taught	PD delivery mode
Teacher K	F	Bachelor degree	11	Economics side	Distance learning mode
Teacher L	F	B. Ed	9	French	Face-to-face mode
Teacher M	F	Bachelor degree	0	Mathematics and science	Face-to-face mode
Teacher N	F	Bachelor degree	0	English	Face-to-face and one module online mode
Teacher O	M	Master degree	8	French	Blended mode

Note: Bachelor degree here refers to BSc or BA and B.Ed refers to a degree related to the teacher education field. Blended mode is a combination of face-to-face and online learning. Online mode refers to learning of content through the internet. Distance learning means engaging with learning materials at home or work, where the provider sent the materials directly to the student (by post or via the internet).

4.5.2 Data production – focus group

A focus group was used to gather data from the participants as it is an efficient and rapid way to explore “people’s knowledge and experience and can be used to examine, not only what people think, but also how they think and why they think that way” (Kitzinger, 1995, p. 299). Kumar (2011) defined the focus group as a method used to explore attitudes, opinions or perceptions towards an issue, product, service or programme through a free and open discussion among group members and the researcher. A focus group is a method for collecting data which has become synonymous with market research even though it was originally developed for academic research (Munday, 2006). The focus group has gained popularity in academic research in the field of health and social sciences. Focus groups provide an exploratory research method according to Krueger and Casey (2009). This method usually brings four to eight participants together. In this study, five participants were grouped together, and there were three such groups (making a total of 15 participants) discussing the same questions designed by the researcher. The optimal amount of participants in a focus group is six to eight, but a focus group can work effectively with three

participants, even though there is a possibility of having restricted group discussions. Kitzinger (1995) argued that the participants can be as few as four per group. Later, Morgan (1997) maintained that three participants in a focus group can be sufficient (Bloor et al., 2001).

The information obtained is more important than the number of participants (Pugsley, 1996; Redmond & Curtis, 2009). To attain data saturation and/or theoretical saturation as suggested by Krueger (1994) and Morgan (1997), three to six different focus groups are enough. Thus, for this study three focus groups were conducted. Focus group discussions not only bring out data but also encourage awareness about the topics under study (Hopkins, 2007). According to Krueger (1988), focus group discussion enables all the participants to share their views and to interact compared to one-to-one interviews. Its flexibility, cost-effectiveness and time-saving potential (that is it can be done in one go) makes it simple to conduct. In comparison to a survey, focus group discussion provides opportunities for participants to be questioned by their peers, thus providing views about the topic (Morgan, 1997). Other benefits of focus groups are that many ideas are generated to explain and explore concepts; they are also relatively quick and easy to organise.

Every participant needed to take part in the discussion. A pilot test was carried out to identify problems that could arise. The instrument was changed accordingly. The questions were grouped under themes. This would facilitate the interpretation of collected data. The disadvantages are that the researcher needs high level skills to manage and facilitate the discussion. Also, participants can express views to please others in the group which are not necessarily their own views (Krueger, 1988).

Questions related to a theme were asked to the group, and each participant responded to the questions. The discussion was recorded using an audio recorder as not all the participants consented to videotaping. The data collected was analysed. The same questions were asked in the three focus groups. All the three sets of collected data were analysed for related themes, until data saturation was reached. The focus group discussions provided an opportunity to describe teachers' beliefs and opinions on the topic providing a deep understanding of the research phenomenon. The researcher explored the thoughts and feelings of the participants about OPD. The data collected were transcribed into a Word file for analysis.

Some advantages of focus groups are described next. Group discussions tend to generate rich information. Moreover, the researcher gains a large amount of information in a short time using this method. Information is obtained from people who are concerned about the issue or are experts in the topic which researchers do not know much about. Furthermore, it provides a representation of diverse opinions and ideas. Group discussion is a relatively effective and cheaper means of generating a huge amount of information. Also, the gap between what the participants say and do can be clearly understood (Lankshear, 1993) by the researcher. Moreover, the interactions allow the participant to re-evaluate and reconsider their individual understanding about their beliefs. Focus groups have limitations also as discussed in 4.4.6.

The researcher designed the questions in such a way to assist the interviewees think about professional development in general, face-to-face PD, online PD and factors that influence their views about OPD. The first two questions required participants to think about their own conception of professional development. The succeeding questions were related to the constructs of the proposed conceptual framework. These constructs are facilitating conditions, social factors, knowledge and beliefs, PD activities, performance expectancy, evidence of student performance and effort expectancy (see Appendix O).

4.5.3 Pilot study for phase 1

A pilot focus group was carried out before the main study began (Greeff, 2011). The focus group consisted of five group members, namely secondary school teachers with different teaching experiences, the first one having three years of teaching experience, the second one four years, the third one seven years, the fourth one nine years and the fifth one 13. There were two females and three males. A consent form was given to every participant giving information about the thesis, and asking whether they agreed to be audio recorded. Only five members were chosen to reduce the time taken for the focus group session due to the availability of the teachers. There were 20 questions for the pilot group. The semi-structured interview seemed to be lengthy for the participants as the teachers would be available for only about 40 minutes. So, once the pilot study completed, based on the answers from the participants, the researcher merged questions where the participants tended to give the same answer or provided the answer in the previous questions. Sub-questions were added

just in case the participants were having difficulties answering the main question. These sub-questions acted as hints to help the participants in their thinking process. Some questions were restructured to obtain more specific answers. The data obtained from the piloted focus group interactions helped the researcher to develop focus group interview questions and grouped them into themes that are manageable (see Appendix D).

4.5.4 Trustworthiness

Trustworthiness is the same as validity and reliability in quantitative research (Munhall, 2011). The main techniques for addressing trustworthiness (validity) in qualitative studies are using different data collection tools (data collection triangulation) (Merriam, 1998; Patton, 2002), offering valuable and thick explanation of the cases (Merriam, 1998), do participant checking (Creswell, 2007; Merriam, 1998; Stake, 1995), and give special consideration to the researcher's know-how (Patton, 2002). In a qualitative study, it can be challenging to determine the trustworthiness of findings. According to Merriam (1998), enough description of the case needs to be provided so that the readers are "able to determine how closely their situations match the research situation, and hence, whether findings can be transferred" (p. 211). The case study provided rich and thick description in this study, thus giving the reader enough detail to determine whether the findings of this context would be transferrable to similar secondary schools' contexts with which he or she is familiar. After analysing the data, a description of the case was sent to the participants for their comment and clarification on the issues discussed in the focus groups. According to Creswell (2007), researchers who carry out case study research, send "data, analyses, interpretations, and conclusions back to the participants so they can judge the accuracy and credibility of the account" (p. 208).

4.5.5 Data production triangulation

Patton (2002) suggested that a diversity of data collection methods should be used as

"studies that use only one method are more vulnerable to errors linked to that particular method (e.g., loaded interview questions, biased or untrue responses) than studies that use multiple methods in which different types of data provide cross-data validity checks. Using multiple methods allows inquiry into a research

question with ‘an arsenal of methods that have no overlapping weaknesses in addition to their complementary strengths’ (p. 248).

4.5.6 Drawbacks of the qualitative approach

Focus groups tend to lead the facilitator in a specific direction that can weaken the trustworthiness of the findings. Discussions can be side-tracked or dominated by a few vocal individuals. The research allowed the participants to talk with each other, ask questions, clear doubts and express opinions. Focus groups generate important information. Yet, such information cannot be attributed to a whole population, but rather concerns a small group of individuals. Therefore, this aspect was handled in the quantitative phase. Another challenge faced by the researcher was to assemble all members of a focus group at a given time. The participants were asked with whom they were more at ease in a discussion. Then the researcher asked the group members in what range of time it would be possible to meet. The researcher had to remind everyone of the meeting 15 minutes before the time scheduled.

Participants may guard their views because of fears of divergence with others. Morgan (1988) added that the researcher has therefore less control on the collected data. The researcher planned the focus group interviews to overcome and moderate these limitations. But still as the circumstances of each situation differs from case to case, the researcher cannot forecast precisely how those participate will construe the factors that impact on their choice to engage in an online professional development programme. The researcher is totally unable to make a rigidly structured experiment or know beforehand what to control, alter or leave out (Baskerville & Wood-Harper, 1992).

4.6 Quantitative approach (phase 2)

To create a generalisable measure of teachers’ beliefs in secondary schools the quantitative approach was adopted. It consisted of a survey data collection and the analysis of the survey responses. Leedy and Ormrod (2005), often refer data collection as descriptive research design in quantitative approaches or simply survey research. Survey research is “a systematic method for gathering information from (a sample of) entities for the purpose of constructing quantitative descriptors of the attributes of a larger population of which the entities are members” (Lepkowski, Singer, & Tourangeau, 2004, p. 2). The quantitative method is a descriptive one as it would only establish association between variables. A

quantitative research design tolerates variation in data treatment, in terms of statistical analyses, comparative analyses and repeatability of data collection so as to ensure reliability. But this approach is able to offer any explanation outside the descriptive level. Quantitative methods are limited in explaining teachers' beliefs about online professional development in depth. The quantitative approach is employed to find cause and effect or the link among variables mainly to substantiate hypothesis or theory (Creswell, 2002; Teddlie & Tashakkori, 2012; Feilzer, 2010). A questionnaire was developed from the outcomes of the focus group. The questionnaire was piloted. The required amendments were made. For collecting data from the respondents a questionnaire was used. The quantitative data results assisted the researcher in the interpretation of qualitative findings such as testing emerging theory, generalising qualitative findings to other samples and validating specific sets of questionnaire items (Creswell, 2003). The questionnaire was administered to a randomly chosen sample.

4.6.1 Research context and sampling

The target population was secondary school teachers in Mauritius. The study sites were two Confessional secondary schools in Mauritius. The schools were chosen for the same reasons mentioned in Section 4.4 (qualitative phase). For this phase of the study the researcher carried out a random sampling procedure to select respondents (teachers) from two secondary schools. In quantitative research, random sampling is frequently used. It has different variations such as stratified random sampling, quota random sampling and systematic random sampling.

The two secondary schools selected were named 'Maya secondary school' and 'Sam Secondary School' (fictitious names). The student population in one school is of mixed ability, while in the other school the students are high achievers. Data was collected from 75 teachers from two secondary schools, excluding those who took part in phase one. The second phase occurred in both secondary schools using a questionnaire which was developed from results of phase one. The overall number of teachers in both secondary schools was 90 including those (15) who participated in phase one.

Hence, a sample size of 75 respondents was selected from two secondary schools including the school chosen in phase one. Hard copies of the questionnaire were hand

delivered to the rectors of the schools by the researcher, and teachers in the two schools were invited to fill in the questionnaire. The surveys were collected within one week. Sixty-five teachers gave back the completed questionnaire with a response rate of 87%. Each questionnaire was numbered before analysis.

4.6.2 Instruments used in data collection (questionnaire)

To answer the four research questions (the first regarding teachers' beliefs about online professional development, the second the extent to which facilitating and inhibiting factors influence teachers' beliefs about online professional development, the third how these beliefs are constructed and enabled and fourth why teachers have such beliefs about online professional development), the entire themes and sub-themes were placed into one of the seven categories a) teachers' beliefs about educational systems; b) teachers' beliefs about online professional development activities and content; c) facilitating conditions for online professional development; d) inhibiting factors of online teacher training; e) performance expectancy; f) teachers' experiences with teacher-training courses; and g) social influence. These were used to develop the survey questionnaire (see Appendix E). Some words or groups of words from the results of the focus group interviews were used to formulate questions for the questionnaire, thus developing a measurement tool for the quantitative phase.

The survey was a cross-sectional one, where data collection occurs at one point in time only. The questionnaire consisted of questions regarding biography, scaled, closed-ended and multiple response type questions. The questionnaire was divided into nine sections. Most importantly, the questionnaire had 10 to 19 items for each of the six factors. The sections were: biographical information, perceptions of teacher professional development, beliefs of secondary school teachers of educational system, online professional development activities and content, enabling factors for online professional development, inhibiting factors of online professional development, performance expectancy, teachers' experiences with teacher-training courses and social influence. The questionnaire, together with the consent form was administered to 75 respondents from the two secondary schools. To improve reliability of quantitative data the researcher used clear conceptualisation of constructs that defined the constructs to eliminate confusion. The researcher also used

precise levels of measurement, that is, a combination of nominal and ordinal levels of measurements. The researcher used a pilot test before conducting the main study.

There are advantages to using a questionnaire. It is more practical. A large quantity of data can be collected from a large sample size in a short period of time. It is also a cost-effective way of collecting data. Anonymity encourages honesty and openness from the respondents. The way of asking questions is more standardised and the presence of the researcher is not necessary. The questions are asked in the same order. Respondents can answer the questionnaire at their own convenience.

The researcher used the Likert Scale as it is the most appropriate scale to measure beliefs. The researcher chose a 5-point Likert Scale as it would be easier for the interviewer to read the complete list of the descriptors (Dawes, 2008). It also increased the response rate and the response quality (Buttle, 1996). Using strongly agreed to strongly disagreed to rate a phenomenon like beliefs in this study reduces the weakness of the quantitative approach which is mainly concerned with statistical data, where most social phenomena, such as health, organisational performance and education, do not obviously produce numerical data (Muijs, 2010).

The sub-themes from the qualitative analysis guided the formulation of the statements in the questionnaire. The sub-themes were grouped under the following headings of the instrument: beliefs of secondary school teachers of educational system (Part 3); online professional development activities and content (Part 4); enabling factors for online professional development (Part 5); inhibiting factors of online professional development (Part 6); performance expectancy (Part 7); teachers' experiences with teacher-training courses (Part 8) and social influence (Part 9). A matrix table showing the link between the qualitative findings and each of the survey items is provided (see Appendix I).

4.6.3 Validity and reliability

Validity is the extent to which a concept is accurately measured in a study while reliability measures the accuracy of the instrument. After the survey had been developed from the qualitative findings, validity and reliability tests were performed. The questionnaire was sent to four participants of the focus group, to ensure that the statements were in line

with what they said in their interview. Groves, et al., (2004) pointed out that all survey should meet these three different standards:

- a) “content standards (i.e., whether the questions are asking about the right things);
- b) cognitive standards (i.e., whether the respondents understand the questions consistently; whether they have the information required to answer them; and are willing and able to formulate answers to the questions); and
- c) usability standards (i.e., whether the respondents and interviewers can complete the questionnaire easily and as they were intended to).” (p. 241).

Five options are available for survey designers to evaluate the draft questionnaire to be able to ensure content, cognitive, and usability standard (Groves, et al., 2004). Reliability of the questionnaire was determined with coefficient alpha (Cronbach, 1984) values. The reliability of items in a questionnaire is acceptable if the alpha is within .70 and .99, but a value of .60 is accepted in social science (Ghazali, 2008). More details about the reliability of the questionnaire are provided in Section 6.2.

4.6.4 Pilot for phase 2

A pilot study was carried out to identify any unforeseen problems with the questionnaire. The latter was refined after the pilot study for its structure, relevancy, validity and reliability. The pretesting sample consisted of five Confessional secondary school teachers. The five respondents were questioned according to the subsequent questions which came from Fink (2003) with regard to the instrument usability: (a) Whether the instructions were obvious for completing the questionnaire; (b) Which questions were not clear, if any; (c) Did they know in what way to add their responses; (d) Were the response choices mutually limited; (e) Were the response choices complete; (f) whether their privacy were respected and secure; and (g) Did they have any proposals regarding the addition or removal of questions, clearing up of instructions or enhancements in questionnaire layout.

They were also requested to specify the amount of time it took them to complete the questionnaire. The responses of the respondents were as follows: (a) the instructions were clear; (b) there were no confusing questions; (c) the way to indicate responses was understood; (d) the response choices were mutually exclusive; (e) the response choices were

complete; (f) they felt that their privacy had been preserved and respected; and (g) they had no responses to this question. The respondents were requested to supply feedback about the questions and also to specify the time taken to fill in the questionnaire. The open-ended question was removed as none of the participants had answered that question. Upon successful accomplishment of the pilot study, the survey was distributed to the pretesting sample consisting of secondary school teachers (n= 4).

4.6.5 Limitations of quantitative approach

In quantitative approach the questionnaire may lead to limited outcomes as the respondents have limited response options. Thus, the results cannot always represent the actual situation. As quantitative researchers act as outsiders, they tend to miss more details when studying a phenomenon (Mays & Pope, 1995). Quantitative researchers relied too much on procedures (Jogulu & Pansiri, 2011), so some quality information is sacrificed for standardisation (Stenbacka, 2001). Moreover, as extensive statistical analysis is required in quantitative research, a lot of time is needed to perform data analysis.

4.6.5.1 Limitations of questionnaire

The questionnaire was administered to a random sample of 75 teachers of two Confessional secondary schools, which are not representative of all secondary schools, and not even the Confessional secondary schools in Mauritius. Moreover, the questionnaire measured the constructs found within the qualitative data set and those derived from the conceptual framework. The questions could be interpreted differently. Also, there was no way of knowing how truthful the respondents were with their responses as the participants took part in the study of their own free will. There was a risk that they were not honest while answering the questionnaire. To minimise the risk, a letter was included to describe the questionnaire and that it would be used for academic purposes and also that the respondents would be anonymous.

There was also a chance that the questionnaire would be neglected; therefore, the questionnaires were sent to the rectors of the two secondary schools to stress their importance and enlist their involvement. There was also the possibility that the participants perceived the questionnaire as time- and energy-consuming; hence, resulting in just ticked

boxes or even left unanswered. Thus, the researcher does not have any control over the responses. To reduce that risk, a 5-point Likert scale was used.

4.7 Ethics, validity and reliability

4.7.1 Ethical considerations

Ethical approval was granted from the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (see p. ii). All the ethical guidelines were observed throughout the study. Respect and integrity should be ensured as the research dealt with people and their opinions (Creswell, 2009). The names of the participants or the school were not mentioned and the participation was voluntary. The risk was low as the participation was anonymous and the topic was not risky as such. The researcher has been honest and no manipulation of data occurred during collection and interpretation. All the participants signed a consent form (see Appendix A) when agreeing to participate in the research (Creswell, 2009). They were informed about the location and storage period of data collected. To ensure privacy and anonymity, all identifying information such as school name was removed. It was also mentioned to all the participants that they could withdraw whenever they want to. Permission was asked in advance, before publishing any information. Moreover, information collected was treated in a confidential manner. Before using the results from phase one in phase two, permission from the participants was already obtained.

Before carried out the focus group discussion, permission was obtained from the Manager of the school and the Gatekeeper. Then the intended participants were approached individually, so as to build a rapport with them from the start of the study as the data collected reflected their voices about their beliefs about OPD, to obtain trustworthy data and establish confidence in the findings.

They were asked if they were keen to take part in this study. The participants and the researcher planned for the appropriate time and place for the focus group discussions after a collegial consultation. A number of safeguards were established to ensure an adequate level of trust between the researcher and the participants. These safeguards were: the participants were informed about the objectives of the research study, transparency in the procedures for collecting data were guaranteed. The written and signed consent forms were collected before the research procedure so that the participants and the researcher are protected (see Appendix

B for participant information sheet). Permission was sought before audio or video taping the focus group. Audio taping was done for the three focus groups only as some participants did not choose videotaping. After signing the consent form, each participant was given a pseudo name to preserve their anonymity. In this research, all recognisable information was retained privately and remained secret throughout the analysis and interpretation of outcomes (see Appendix A for consent form).

4.7.2 Sample integration legitimisation

This type of legitimisation was applied as the researcher wanted to perform a statistical generalisation from the sample participants to a bigger target population of secondary school teachers in Mauritius. The significance of generalising the findings was to see whether the findings coincided. To cater for insider-outsider legitimisation, first for the insider viewpoint, the participants reviewed the researcher's interpretation of the data. For the outsider viewpoint, peer review was used as strategy. The interpretations made, the conceptualisations and the relationship between the data and the conclusions were examined by another researcher. To obtain justification for the meta-inferences, the qualitative research sought the insiders' view; the quantitative research sought the objective outsider view and the mixed research sought to fully balance these views.

With regard to external validity, the findings cannot be generalised from a sample to a large population as the results are highly contextualised. The result can be applied from one context to other similar contexts as sufficient detailed data have been provided to understand the meaning of the study and the study background.

The researcher utilised quotations of participants' views directly within the text summary. The study data was showed to the participants before analysing and for member-check to obtain their approval (Janesick, 2003). Member checking is a "procedure that involves asking participants in a qualitative study to check the accuracy of the research report" (Fraenkel & Wallen, 2008, p. 663).

4.7.3 Validity and reliability

In mixed-methods approach checking of validity at every stage of the study and through the mixed methods is needed. In mixed methods "inference quality" is the same as

the term validity which quantitative researchers used or “as the mixed-methods term for the accuracy for which we have drawn both our inductively and our deductively derived conclusions from a study” (Teddlie & Tashakkori, 2003, p. 36). It comprised design quality and interpretive rigour. The design quality could be evaluated through the principles established in qualitative methods such as triangulation of data sources and quantitative methods such as internal validity checks. To determine the validity of the questionnaire instrument some measures have been taken into consideration. Each item of the questionnaire should be readable and understandable by non-expert and non-professional respondents. The researcher and peers verified the qualitative data for validation. Member checking following the focus group and interpretation of the data gathered was carried out to ensure trustworthiness and also to assess interpretive rigour. The researcher built a rapport with the participants so that they could feel at ease in sharing their feelings, insights and experiences without any pressure (Lincoln & Guba, 1985). In-depth methodological descriptions were used to allow the study to be repeated, thus ensuring dependability and also to allow integrity of research results to be analysed to ensure confirmability. The qualitative phase used a small sample and a larger sample was used in the quantitative phase (Creswell & Plano Clark, 2007). Data triangulation was ensured in each phase of the study. The data collected in phase 1 focus group was compared to data obtained in phase 2 questionnaire. To determine which data set produces consistent data in the questionnaire, internal reliability was considered.

4.7.4 Delimitations of the study

The capacity of instruments to represent the actual teachers’ beliefs is limited by the participants’ ability to conduct an accurate self-appraisal of their own beliefs to capture their beliefs. Therefore, more self-appraisal questions were inserted into the questionnaire. The researcher must be comfortable with the approaches. There is a risk that the researcher tries to accomplish too much in a particular study, thus weakening both quantitative and qualitative approach. To minimise the risk, the researcher used peer review (critical readers and methodologists). The study focused on three independent constructs of performance expectancy; social influence and facilitating conditions; and moderator variables of gender, age, experience and voluntariness of use from UTAUT model. These variables may not be

the only variables that influence teachers' acceptance and use of OPD. The analysis also focused on constructs such as content, strategies, site and media from teacher learning model to direct this study.

4.8 Synthesis

This chapter has dealt with main domains of the study, both philosophical and practical facets of the selected methodology when doing research. This section has provided an overview of the mixed methods used in this thesis. A description of the interpretive method and the selected research approaches was provided in this study. Justification for selecting a mixed-methods approach was also discussed. A mixed-methods approach was used in the sense that the quantitative findings were used to strengthen the qualitative findings. The use of the sequential exploratory mixed methods is also addressed. Furthermore, this chapter discussed how the researcher dealt with ethics, validity and reliability. The chapter also presented the research design, the sources of data and how the data were collected and analysed to contribute towards achieving the research purposes. The limitations of the chosen research methods were discussed. The first phase is discussion of qualitative analysis in the chapter to follow, given that the study was carried out in two phases.

CHAPTER FIVE: QUALITATIVE ANALYSIS

5.1 Introduction

The previous chapter was about the research design and methodology. Now the focus is on the analysis of the qualitative data. **Section one** is the introduction to data analysis. **Section two** deals with data analysis of the qualitative data. **Section three** is about teachers' experiences with teacher-training programmes. **Section four** is about the analysis of online teacher training use behaviour. **Section five** provides the analysis of the challenges of online teacher training. **Section six** offers an updated version of the conceptual framework. **Section seven** describes how the qualitative data produced and analysed informed the second phase. **Section eight** is a synthesis of the chapter.

5.2 Analysis of the qualitative data

The analysis for phase one served to answer the research question concerning factors influencing teachers' beliefs about OPD. The case study design provided an in-depth understanding of the factors affecting teachers' beliefs about online professional development and thus their behavioural intention to use online professional development. Data analysis comprised three steps, data reduction, simplifying data collected and transforming new data occurring simultaneously (Miles & Huberman, 1984). The data produced through focus groups interviews were first transcribed into a word processing file for analysing (Creswell & Plano Clark, 2007; Flick, 2008). Transcribing data means converting the oral interview data into a written structure for analysis purposes (Creswell, 2005). The researcher did the transcription to preserve the anonymity of the participants. In consultation with the participants, the discussions were carried out in Mauritian Creole to enable them to better express their views and to elicit richer information without any language barrier. Nonetheless, for the purpose of the thesis write up, the quotes have been translated from Kreol Morisien (KM) to English. The names used are pseudonyms.

After transcription of all data, the process of coding began. Merriam (2009) described the coding process as “making notations next to bits of data that strike you as particularly relevant for answering your research questions” (p. 178). While preparing the data, focus

was on the next data collection. The intention was to group data into categories. The data from each group were coded without any comparison or matching (Merriam, 2009).

When the coding was finished, the themes development process started. This process was described as “(going) back over your marginal notes and compartments (codes) and (trying) to group those comments and notes that seem to go together” (Merriam, 2009, p. 179). The researcher went through the data of each group and grouped the codes in similar categories. The data was then translated into English language as the focus group discussions were done in Creole, the native language of the participants. Then the data were analysed. The process of analysing the data in the case study involved finding patterns in the data.

Grounded theory being a good method for analysing data in exploratory studies and in this case teachers’ beliefs about online professional development, it was used for analysing the data in this study. Glaser and Strauss (1967) explain grounded theory as being “readily applicable to and indicated by the data, and is meaningfully relevant to and is able to explain the behaviour under study” (p. 3). Moreover, it is useful for understanding contextual elements (Orlikowski, 1993). This approach is used so that the contextual aspect of OPD usage is not neglected (Lawrence & Tar, 2013). Moreover, the interpretive orientation of this research fits well within the characteristics of grounded theory which are inductive, contextual and processual (Lawrence & Tar, 2013). Thus, as an analytical tool, grounded theory is appropriate to provide an insight about factors influencing beliefs about OPD, why such beliefs and how such beliefs are constructed (Strauss & Corbin, 1998). Strauss and Corbin (1990) identified three analysis levels: (a) presentation of the data without interpretation and abstraction, where the participants tell their own story or views; (b) using field notes, interview transcripts and researcher’s interpretations to generate a rich and believable descriptive report; and (c) using high levels of interpretation and abstraction to build a theory. In this research, the second and the third levels were combined for presenting rich and comprehensive descriptions; this can help when transferring the case study findings to an alternative setting to make enough contextual judgements. Researchers have been warned by Strauss and Corbin (1998), that rigid adherence to any procedure can hinder the analytic process and stifle creativity.

The procedure for using the analytical tool is to find key phrases or words in the data gathered and then relate these phrases with meanings as described by Strauss and Corbin

(1998). First, open coding, which is the “process through which concepts are identified and their properties and dimensions are discovered in data” is used (p. 101). The data is then broken into discrete parts before being compared. Next, axial coding, that is the process creating subcategories and associating these with “properties and dimensions”, is used (p. 123). Last comes the selective coding “integrating and refining the theory” (p. 143) using categories and their associations with subcategories (Strauss & Corbin, 1998).

The reasons for choosing the grounded theory were numerous. The grounded theory contributes in areas where little research has been done. Regarding secondary school teachers’ beliefs about online professional development, little research has been carried out as stated earlier. The grounded theory approach also helps in the development of theories about the phenomenon being studied; moreover, it produces accurate and useful results. It suited interpretive research due to the following characteristics: it was inductive, contextual and processual. Furthermore, this approach provided the research with strategies to sift and analyse a large amount of data gathered in non-standard and unpredictable formats. Grounded theory helped the researcher to develop and describe theory and explore the interactions of contextual conditions and the consequences.

A descriptive analysis pertaining to the focus group discussions conducted during the first phase of the study is presented in the next sections. The “heu”, the pauses and unnecessary words, have been removed from the translated version so that the researcher could make sense of the data for analysis. During the data reduction stage, the focus groups transcripts were reduced and organised by coding, writing summaries and irrelevant data discarded. It was still ensured that there was access to them later after leaving the room for the re-examination of unexpected findings that might have been previously considered unnecessary or left out. The data were analysed to identify patterns. The patterns are issues that appeared recurrently across the interview transcripts. The analysis took place within each case as well as across the cases to identify similarities and differences. The generated data was coded and scrutinised, focusing on aspects that affect teachers’ intention to use online professional development.

Different themes emerged in the study after analysing the data. The grounded theory and an inductive approach were used to obtain the themes below. Themes were chosen according to what the data described. During the analysis the researcher followed the

following steps. First the researcher read and found the categories which were suggested by the data collected (open coding). Next the researcher found links between themes or categories (axial coding) and finally the researcher found the core category (selective coding). Four themes were identified, as follows: (1) sources of knowledge and their applications; (2) technological factors; (3) challenges of online teacher training; and (4) policy challenges. These themes were further refined to evaluate how they fitted with the data (well or poorly). After deeper analysis these four themes were reduced to three themes, namely teachers' experiences with teacher-training programmes, online teacher training and challenges of online teacher-training. The three themes were further broken down into sub-themes. These sub-themes revealed the factors that influence or inhibit teachers' beliefs about online professional development. Each of these themes is exposed in Table 5.1.

Table 5.1: Emerging themes during data analysis

Themes	Sub-themes
Teachers' experiences with teacher training programmes	Theory versus practice (perceived usefulness)
	One-size-fits all
	Course duration
	Professional growth and progress
	Social influences
	Teacher professional development and students' learning outcomes
	School context
Online teacher training use behaviour	Teachers' conception about online learning
	Motivation
	Benefits of online teacher training
	Facilitating conditions
Challenges of online teacher training	Implementation
	Formal and informal learning
	Course structure
	Unfamiliarity
	Human contact
	Health problem
	Self-discipline
	Authenticity of students' work

Themes	Sub-themes
	Curriculum constraint

There are several elements that affect teachers’ behavioural intention to use online professional development, such as theory versus practice, one size fits all, course duration, professional growth and progress, social influences and teachers’ conceptions about online learning. Other equally important factors are teachers’ motivation; benefits of online teacher training; facilitating conditions; formal and informal learning; and course structure. Unfamiliarity, human contact, health problems, self-discipline, authenticity of students’ work and curriculum constraints influence teachers’ beliefs about online professional development. Nonetheless, these are not the only elements that affect teachers’ beliefs about online professional development. However, these are emerging factors that influence teachers’ beliefs about online professional development in this case study; this is not an exhaustive list, but one determined by the scope of the study. Creswell (2007) states that after completing the process of thematic development which Merriam (2009) describes as “mak[ing] sense of the data”, the following step is data representation. This is described as the “process used to answer your research questions” (Merriam, 2009, p. 176):

As soon as a tentative pattern of classifications or findings or themes has been derived, it is required to arrange the entire of the confirmation for a scheme into groups. These categories were visualised as “buckets or baskets into which segments are placed” by Marshall and Rossman (2006, p. 159). “This is done by creating file folders each labelled with a category or name”. (p. 182)

In qualitative research, the presentation of the data serves also as the final analysis process as put forward by Creswell (2009) “the process of data collection, data analysis, and report writing are not distinct steps in the process – they are interrelated and often go on simultaneously in a research project” (p. 150).

5.3 Teachers’ experiences with teacher-training programmes

5.3.1 Theory versus practice

According to the study participants, the teacher professional development course involved workshops, seminars, training and classroom visits where the trainers disseminated

a lot of theories unrelated to their school context. The quotes below show evidence of teachers' views about the content of teacher professional development courses related to their context. The participants reported that the course content tended to be mostly theoretical. But teachers need more specific courses which are related to their work which is practical in nature.

“A lot of theoretical things, as if taken from books but which don't bring many answers-answers which we really need, which we need in class because I think each school has its reality and each class its reality,...but how can this really help us in our classroom ... I remain a bit sceptical.” (P14)

“I agree with what he has just said. It is true that it is mostly theoretical, ...some theories which we cannot apply because they are based on a different school with not the same context. The context is different. It is true that it can help us think but the application of these theories ... is now becoming a little more complicated.” (P13)

“Professional development is not only about showing me theory but how to apply it. You can have a very good theory but if I cannot apply it in my work, how can this help me to develop?” (P21)

“More often, some people are delivering knowledge without really knowing the reality of the school. Such statements do not work in practice as the situation is different in each school.” (P11)

A teacher stated clearly that not all the theories learnt in teacher training programmes are useful in the school context, and that there are other factors that prevent the implementation of these theories. There is a gap between the content knowledge and its application; the training programmes are not filling this gap. There are many factors, for example, the school culture, the students' performance, teacher-student ratio and students' background at the school level which have to be taken into consideration. These factors may have been taken on board while explaining the theories in the teacher-training programmes, or there might have been other factors which were not related to the school context.

“We do a lot of things to implement the theories learnt but in the end they cannot be applied. We cannot apply them well, when we come to do our class as there are factors (like school culture, the students' performance, teacher-student ratio, and students' background) which are there that prevent us from doing our work.” (P11)

The participants claimed that in traditional professional development, the trainers used book, board and chalk to deliver the content to the learners. The training is teacher centred and the student teachers are not considered as adults as revealed in the following quotation. Moreover, their teaching experiences are not taken into consideration. The course is more about delivery of knowledge.

The trainers

“use book, board, as a teacher in a classroom...that is traditional as was done before.” (P24) “As if, book approach”... board, chalk.” (P32)

“Even though the trainer comes to the school, he/she does not know the school context. The trainer just talks about theories which are not really applicable to our classroom situation.” (P14)

It seems that the participants prefer PD which focuses more on practical activities which can be a help in their daily teaching activities. OPD has the capability to offer such PD to teachers. In contrast to OPD such face-to-face PD is offered in one-size-fits-all mode which is our next point.

5.3.2 One-size-fits all

The participants indicated that training carried out in face-to-face mode through workshop or seminar delivered in one-size-fits-all mode (general form) is not adequate for the school context. The pedagogy must not be crammed by the curriculum to enhance creativity and innovation. We must find alternatives for one-size-fits-all education so as to cater for learner learning differences and help the learners to develop at their highest potential. These PD alternatives must provide opportunities for teachers to have access to resources which are more specific to their needs. Online PD can provide opportunities to offer more tailor-made PD for teachers.

“In reality offering courses which are more specific will be more adapted and relevant to our context and our situation. More research needs to be done first. But don't put general courses which we can have anywhere on the internet, more specific ones are needed.” (P14)

Usually the trainer just uses a PowerPoint presentation to transmit knowledge to a group of teachers who come from diverse schools. These teachers have different individual needs. In such cases, their needs are not met. However, the training institutions may provide the resources but who will train the trainers to use the resources? The trainers must be up-to-date with technology also, so that they can promote the use of technology in trainees' classes. Moreover, the teachers have to implement the learnt theories on their own without any support from the trainer.

“In a classroom even with a PowerPoint presentation, the trainer is talking, giving the same information to all of the teachers in the traditional way ... When we come to our reality unfortunately, we cannot put these theories in practice. We learn a lot of things theoretically.” (P22) “It is as in a school, with a board, one projector, multimedia, where the trainer is giving you knowledge such as concepts.” (P21)

Teachers tend to describe traditional courses as what they have lived in their former experiences when they were students, where teachers were the knowledge authorities and students were the passive recipients of knowledge. This is illustrated by the excerpts below:

“Where the child did not have much to say, as if, it is what we have known before...It is the teacher who has the knowledge.” (P34)

“It is not student-centred, as if it is more like the teacher says, talks...” (P32)

From the quotes, we understand that teachers need adaptive PD programmes which face-to-face PD cannot provide, being offered in one-size-fits-all mode compared to OPD. Also, the duration of the course, which will be discussed next, needs to be taken into consideration.

5.3.3 Course duration

The participants made it clear that course duration is an important factor. The findings show that teachers would be more interested in ongoing short courses compared to those extending over a full year, for example. The school can set up a calendar which fits the busy teachers' schedule. The duration of the professional development courses needs to be flexible so that every teacher can benefit. Teachers must have the opportunities to quit and/or enrol in lengthy courses when they want.

“It depends how much time the course will take.” (P35)

“Me, I will go, I will follow if it is a short duration course (short duration), if it is not a year.” (P31)

“Maybe we will go ... if not daily.” (P11)

As the three participants have highlighted, teachers have a preference for short courses. Therefore, if the PD courses extend over a long period, teachers would not attend or would attend as they have been asked to do so, for form's sake, but there will be no professional growth and progress.

5.3.4 Professional growth and progress

The teaching profession is seen as a noble work in general, as teachers hold multiple roles during their daily work. For example, a teacher can act as a counsellor and then switch to being an educator. Teachers educate children who are not theirs. But even though the salary is not quite as attractive as in other professions, many people want to join this profession because of the fairly light workload. Sometime people join the teaching profession just to secure a job. But teaching is not just a job where only performance is recognised; it is what we call the “school of life” as what the students learn can influence their lives forever. Teachers are involved in the creation of a labour force for the country, including the leaders of tomorrow. That is why teaching must be recognised as a profession like other professions. Thus, people will be happier to become teachers, but to be a teacher is not the ultimate goal; it is only the beginning of a long journey.

Although teachers felt that traditional professional development programmes were rather theoretical, they did acknowledge that they got some benefits from the programmes. They admitted that they grew and progressed professionally though only their knowledge content improved. They pointed out that teachers need more than just having more knowledge. They need to be shown or advised on how to teach, otherwise they will stagnate. The professional growth and progress can be in terms of promotion also. But in the teaching profession not all the teachers have the possibility to be promoted to a higher grade, as promotion is limited to Senior Educator, Deputy Rector then Rector. Teachers will be more motivated if they have more possibilities to develop professionally and grow, that is have

more career paths, for example, there should a possibility where more teachers can aspire to be Senior Educator, like Senior Lecturer in some universities.

“A teacher needs professional development programmes to help her or him to improve above just being a teacher ... Yes, you are proud of yourself and being valued with respect to training and promotion that you get ... Professional development enables you to grow in what you are doing therefore you are happy.” (P31)

“Which means that you are progressing, but progress needs to have knowledge, this is another thing essential for us to be able to improve the way we do in class ... a lot of things that make us progress on the ground of knowledge but not professionally.” (P22)

“There are many elements that work together for you to develop and progress, for example, you have to master your subject well, have a good students’ response as well. If you do not have a good students’ response you will stagnate.” (P14)

“I view professional development as a source of personal satisfaction and motivation.”(P32)

“Training that helps in our daily teaching.” (P11)

“As book knowledge is not enough, we need professional development to enable us to do our work more efficiently. We need more facilities.” (P13)

“There is possibility of promotion, where you can see you are evolving (progressing).” (P34)

As being a teacher is also to be taught how to teach; therefore, opportunities for engaging in professional development must be made available to teachers. The professional development programmes must be delivered in different modes, for example, online learning, so that all teachers can have access to these programmes without any barriers. Since teachers need to keep up with the newest innovations in the educational field, they must have access to updated resources. This may help them to be capable to cater to the ever-changing students’ needs. Another way to value the teaching profession could be to provide opportunities for teachers to participate or attend international conferences in the educational field. The participants indicate that professional development should be ongoing to promote lifelong learning and be informed about the recent changes. Teachers must be in touched with technologies, new research in teacher education and student learning. Therefore, teachers

need to constantly improve their knowledge and skills to grow professionally, mostly with technologies which are developing rapidly. But in Mauritius face-to-face PD is not readily available for teachers, and the same is true for online or blended professional development.

“We need to be up-to-date with regard to all latest advancements which have been achieved.” (P22)

“It is to keep informed as Sheila said informed all the time in the field. Lots of things are changing, even the technology.” (P34)

“I think lifelong learning is important.” (P32)

The participants pointed out that they need more than just theories from books. They made it clear that teachers need PCK. Teachers need practical skills which their tutors can demonstrate to show them how theories learnt from books can be applied in class. Teachers need pedagogical skills to improve the teaching and learning environment in the class. Therefore, professional development must be able to consider the changing needs of teachers and their students to be able to support high-quality practices. They stress the point that even though subject mastering is important, they need more than the didactics which they can learn by themselves.

“Access to facilities (others’ experiences, knowledge) also will enable us to do our work, to develop as a teacher because having a book, a class is not enough ... Mastering of the subject is important but we need more than mastery. Now we can master the subject but if we don't have this plus, that is access to facilities, we cannot develop.”(P13)

“Have different strategies as if to become more professional and have strategies and as if to be able to know what can be more useful, in what context as if... in another context how he/she can shift and juggle with all the strategies that he or she has.” (P34)

“Training that can help us in our work... This means, class management, how to (keep) maintain a class, how you can deal with your subject.” (P11)

“You have to master your subject well.” (P14)

“Firstly you must know the subject you will teach and then class management.” (P32)

A teacher was appreciative of the courses offered by the local teacher-training institution which included practical sessions:

“courses at the MIE for example, you have to attend work and not just follow the course to have experience. I do not know how long this system has been set up and if it can be considered traditional because finally it is not only theories but includes a practical component.” (P33)

Another teacher added that

“because you need to live what you are doing, in your experience, what you have learnt in books, in theories.” (P32)

“As book knowledge is not enough, we need professional development which provides more support to enable us to do our daily work more efficiently.” (P13)

Teacher-training programmes stress didactics rather than “how to teach” for a holistic development of the learner. Therefore, more needs to be done to encourage teachers and leaders to acquire new knowledge and sustain existing skills.

“We are forced to go through this kind of professional development which favours only the cognitive aspect of the learner, leaving aside the mental, intellectual, emotional and psychological aspect of the learner. We have no choice as the system is an elitist one aimed at producing ‘laureates’.” (P23)

“You have to master your subject well ... Professional development is not only about mastering the subject but also how to teach the subject.” (P14)

A participant added that teachers find the course boring or repetitive that is why they are not keen to go for professional development courses. So teachers need to see the usefulness of PD courses or programmes to enrol in these courses and get the best out of them. Only then will teachers grow and progress professionally.

“The course is boring, it is not appropriate for me and I do not have time.” (P31)

“There can be no motivation, moreover it is repetitive. I have already heard about it.” (P34)

So for teachers to grow and progress after following PD, they need to be intrinsically and extrinsically motivated. One extrinsic motivation can be the impact of PD on students' performance.

5.3.5 Teacher professional development and students' learning outcomes

The objective of teacher professional development is to be able to improve students' learning outcomes. But in reality it is difficult to find the link between teacher professional development and students' learning outcomes. Moreover, the training programme is delivered off-site – that is away from the school. Sometimes it is very difficult to apply the strategy learnt during the course in the classroom context, as no support is being provided during the implementation of the strategy. The resource person is not present to help the teacher to better implement the strategy.

“For you to develop personally, you have to have a good response with the students with whom you are working ... The resource person told that the course will be more adapted for your students.” (P14)

When the management has provided professional development for the teachers, they expect a positive influence on the students' results as time and/or money have been spent for the professional development activities. Otherwise, the teacher will have to explain why the expected outcomes have not been obtained. Most often when students fail to attain their full potential, it is the teacher who is blamed. Professional development does not necessarily mean better students' outcomes as one may think.

“The management will ask you why the students have not worked, why the whole class has not worked, you have to explain.”(P21)

The objective of TPD is not being met as the PD content does not meet teachers' needs. Moreover, they are not motivated by their peers to attend such PD programmes.

5.3.6 Social influences

Sometimes teachers may be willing to follow PD courses, but they are discouraged by their colleagues who tell them that the course would be of little use. The social factor is a very important issue in education, as learning happens through social interaction. Teachers

need to learn from each other, as no one has solutions to all the issues that happen in the classroom.

“I was also discouraged by friends who advised me not to follow this course, because it is useless.” (P31)

The participants claimed that teachers tend to isolate themselves due to social influences, as they are afraid of being judged by their colleagues. They do not come forward to share what is happening in their class. They fear the comments of their peers. Online learning must cater for this type of learners. One way of catering for shy teachers is to provide the possibility of being anonymous.

“When it becomes talk of town [gossip].” (P11)

“This is true, gossip can lead to an issue. Even if these teachers have offers for professional development, they prefer not to go forward maybe ... when you are online ... may be also, the fact that ... we don't consider the fact that many teachers don't describe what happens in the class, for fear of being judged, not being understood.” (P13)

Teachers tend to work in isolation as they fear of being judged as they are supposed to be experts in their fields. In the school context they are seen as the one who delivers knowledge.

5.3.7 School context

Every school has a particular culture which depends mainly upon student intake, location and the type of school (state-owned or grant-aided private, including Confessional schools and privately-owned schools or fee-paying schools). All schools are facing problems like indiscipline, violence, substance abuse and absenteeism, among others. These problems occur for different reasons dependent on the school context. Absenteeism, for example, is a culture in high-achieving schools as students prefer to stay at home for revision or attend private tutoring rather than go to school. Indiscipline at school can result from the fact that students' needs are not being addressed by the schools and the authorities.

Private granted-aided schools have to welcome many students with difficult backgrounds such as poverty. Most of the time these students tend to be low achievers. In a

sense these schools feel compelled to welcome them as the number of students is also a factor which is used to calculate the school grant. On the other hand, teachers are asking for a lower teacher-student ratio. Teachers are most often discouraged from enrolling for professional development as they will not have the possibility to implement what they have learnt. The teachers are investing their time and money while the students are not keen to learn. Furthermore, most of the time, they do not get the required tools to face these types of students during the professional development training. Additionally, the curriculum, the pedagogy and the evaluation system at secondary level may be outdated and a rethinking process of the whole system is needed. Education is not only about acquisition and accumulation of knowledge but also about developing the personality of the learner to become more committed.

One participant from the focus group interview acknowledged that professional development does not meet the needs of the school where the participant works.

“Mostly the schools like ours, it is useless to enrol in teacher professional development.”
(P11)

Another issue is that teachers can enrol for professional development where they learn many teaching and learning strategies, but they cannot apply these strategies in their class context. This is because of the autocratic management at school. No relevant support is being provided to them. In some cases, teachers are still using chalk and board. But in professional development courses, they have learnt and been encouraged to use other strategies such as video clip to enhance students’ learning.

5.4 Online teacher-training use behaviour

5.4.1 Teachers’ conception about online learning

Online learning promotes active learning. Teachers can engage in online discussions by registering in forums which can be anonymous also. An online teacher-training course is viewed as a distance learning course, where the teacher can have all the materials online; more importantly the teacher can follow the training when he/she feels the need.

“We prefer distance learning, we get all online, can do it when we want.” (P35)

“Perhaps having access to more facilities, for example, knowledge, others’ experiences strategies etc. ... It is better than waiting for someone coming in class to help you, maybe you will wait eternally but now help is more available and accessible. When you are online, it can be anonymous, you can look for a solution with respect to some problems that you have.” (P13)

Another participant added that in online learning the teacher is more at ease to learn as it is boring to sit day and listen in a classroom setting during the whole day:

“And then perhaps we are more at ease than listening for a whole day. In such situations the student can switch off at any moment ...if we are studying online at home we can access the course at our choosing.” (P11)

This will reduce the burden of contact hours.

He also appreciates that he has the possibility to study anywhere, when he wants by just connecting to the internet. Teachers do not have to travel as online learning provides the possibility to study at your convenience.

“I do as if I do not need to go anywhere. I connect to the internet, I get all the information. I learn by myself and I love this way of learning. I do not like studying in situations where you go and sit in a class.” (P31)

Experienced teachers think that young aspirant teachers tend to be more technology oriented, as most of them are digital natives. In the 21st century more and more institutions offer online courses. Therefore, whether experienced or novice teachers, all have to change their attitude towards online courses or new technologies. It is not only the concern of novice teachers.

“I think it is about generation, as I said before, when I was at the university I used pen and paper, and I got my degree after three years. Ten years later I find that universities can offer courses where all is online.” (P21)

Teachers’ conceptions about online learning are a significant factor which influences online teacher-training use behaviour. So, if teachers view OPD as a way to improve their work, they will be motivated to engage in OPD programmes.

5.4.2 Motivation

The participants made it clear that teachers need to be motivated to successfully engage in professional development mostly when it is online. As a Bachelor's degree in the relevant subject area is usually the requirement to be a secondary school teacher many teachers, once in the profession, are not keen to follow professional development courses. Teachers need to be professionally passionate, so that they remain motivated throughout their teaching career.

“We are happy, somehow to be a teacher a simple degree is sufficient.” (31)

“Now, as it is often said, a simple degree is sufficient to be a secondary school teacher.” (P35)

“I think that you need to be passionate about your work to do it well. It is very difficult to develop professionally if you are not driven by a passion for your work. If you do not enjoy what you are doing you stagnate.” (P14)

“Must have the desire.” (P33)

“Finally, it is true that you need to have a personal desire for you to progress.” (P35)

A participant argued that teachers should be able to make much profit of the courses they followed as a source of motivation. This motivation for ongoing study can be enhanced by a stimulating working environment. Moreover, as we are living in a society where technology forms part of our life, it is vital for teachers to continuously update themselves in TPACK. Thus, will enable them to use ICT tools in their classroom which may enhance students' learning. The school management should cater for the emotional aspect of the teachers, thus promoting a working culture conducive to ongoing professional development.

“A source of motivation, the participant must be able to benefit from this motivation to continue studying.” (P33)

There is also the morale of the teachers which is a source of motivation. The morale is referred to as incentive factors that positively or negatively impact teachers' intention to engage in professional development. Respect, honour, responsiveness, job security, trust, support and salary increase influence the morale of teachers. A participant acknowledged

that more often the teacher is blamed for most of the negative outcomes at school, for example, bad performance of students.

“More often we have the tendency to blame the teacher.”(P11)

Many teachers do not share the problems encountered in their classroom, as they are afraid of being judged or not understood by their peers or the trainer.

“We don't consider the fact that many teachers don't tell what happen in the classroom, afraid of being judged or not being understood.”(P13)

Teachers may be willing to follow professional development courses. But they want to be rewarded in terms of a salary increase. The question that teachers normally asked before enrolling for a course is how much salary increase they will get, and they expect it to be significant. In a sense they are investing for the country to get better workforce.

“By the way, you are investing, but for whom, for the school, for your students and for the country.” (P33)

“How much will you get more on your salary?” (P32)

“Must get at least Rs5000 when you have followed a course.” (P31)

For instance, teachers are not satisfied with the current face-to-face programmes as they are not benefiting from such programmes. Additionally, it is not compulsory while engaging in the teaching profession. Teacher want salary increase as extrinsic motivation for them to engage in PD as they are investing their time and money. On the other hand, one benefit of OPD is that it can be free.

5.4.3 Benefits of online teacher training

Teachers do not have to move or travel long distances to attend courses or training. The courses or training are available at their fingertips, while the conventional form of professional development is restricted by factors such as time and place. The participants have to move to a physical place at given time to attend such trainings. Thus, time is saved and can be invested in other activities.

“The training can be delivered online instead of going to ICJM.”(P11)

(ICJM stands for Institut Cardinal Jean Margéot, an institution where teachers in Catholic schools can follow some kind of professional development courses.)

Online learning is viewed as a solution for situations where teachers are shy or afraid to express themselves for fear of judgement from their peers or even the school administration.

“May be also, the fact that ... we don't consider the fact that many teachers don't describe what takes place in the class for fear of being judged, not being understood.” (P13)

“A teacher wanting to have a solution to a problem that happened in a class can become a gossip when explaining this problem in a teacher-training programme.” (P11)

A participant stated that he prefers self-learning where he can learn at any time. He does not have to go to a class.

“We get all online, can do it when you want.” (P35)

“I do not need to go in a specific place, I connect to the internet, I get all the information, I learn by myself, I love this way of learning, I do not like the situation where you go and sit in a class.” (P31)

A forum is proposed as a solution, for teachers to have a space to express their opinions freely without being judged. That is why PD is a challenge.

“PD has become an issue. Even if these teachers have professional development, they prefer not to go forward may be ... when it is online this situation may change.” (P11)

“With regard to what we are saying it is interesting enough. We need a forum where we can express what we think ... a forum is a group discussion where people are free to talk and say what they think online. It can be a super forum as it can be constructive. We can give our point of view to be able to move forward.” (P14)

The forum is also viewed as psychological support, where members can support one another.

“Me, I find it more as a psychological support when we reach an agreement ... online.” (P14)

Teachers have a busy time schedule in the sense that they have their workload, have to follow professional development courses and manage their family lives. So they have to manage their time effectively so that none of their commitments are neglected.

“I manage my time at will.” (P14)

“In a situation where you have children, it is more adapted go online when you want, when you finish doing your household tasks.”(P32)

A teacher shared her experiences with online training and stated that she benefited from this type of learning. She has been able to be in contact with experiences of foreign teachers.

“Finally I also agree. Already there is the fact that you can save time, you do not have to move, but also online is not restricted to Mauritius, because I have been able to do online courses with universities mostly in America; but I have seen that you can get into contact with other people abroad and can share their knowledge as I did here last year. This year I am doing an exchange programme with students from America. Next time, I’ll be sharing with those from Norway and if I can get in touch with Mauritian students, the online courses for teachers can make participants more professional in their work, because they get these exchanges as I did. I was very lucky, you see, I saw how courses abroad function. They do not focus only on their own country but worldwide. I think it is important for us in Mauritius to follow these examples as if not only Mauritians are teaching.” (P34)

She argued that it was the best course she has followed in the past eight years as she managed to get foreign experiences locally. She made it clear that the content was more important than physical human contact. Moreover, using technology may help teachers to improve their professional practices through exchange, adapt new or existing teaching and learning strategies to meet needs of learners who are familiar with social media. Thus, teachers would feel more confident in using new technology.

“In eight years, it is one of the best courses I have followed. It was of short duration but when I compare it with others which were not worth much. I really loved it as I found it so enriching even if there was no physical contact.” (P34)

The participants made it clear that in the traditional mode it is very difficult to have foreign teachers sharing their experiences with local teachers in the same physical location, whereas in an online environment this happens.

“It is difficult to arrive at a time where all people meet in only one physical place, sitting, so contact....” (P33)

“On the internet it is easy.” (P31)

“In a conventional classroom setting you will never be able to have teachers from different countries discussing an issue simultaneously but online it can be done.” (P33)

The teacher claimed that even in Mauritius it is difficult to meet physically to share their practices, as teachers prefer to invest their time in other activities.

“Even in Mauritius if participants come from different schools it is difficult to meet for an open sharing of opinions at a given time.” (P33)

These benefits of OPD influence teachers’ use behaviour of such system. Teachers can access foreign resources locally (can be at home) which is very difficult in face-to-face approach. But this can be achieved if the facilitating conditions are available.

5.4.4 Facilitating conditions

The teacher added that in an online learning environment, the participants can discuss anonymously. This will give teachers opportunities to give their views freely without being afraid of being judged by their peers or even the tutors. Therefore, the professional development tasks can be more beneficial for teachers in meeting their goals.

“Yes that’s right. It is anonymous, so the participants can express themselves freely.” (P13)

“More often in some courses you do not have a genuine opportunity to give your point of view ... but at the same time you do not want to lower the image of your school or you are afraid that your comment will be considered stupid, shallow, lacking in depth and you will be embarrassed by fellow teacher students, colleagues or tutor’s comments.” (P11)

Another participant added that enabling teachers to give their views can help others to find solutions to their problems and at the same time create a pool of knowledge. This pool of knowledge can be accessed at any time. In an online environment knowledge will always be accessible compared to attending courses or workshops where the resource person will not be available later.

“I think having a pool of knowledge also is a plus ... moreover giving their points of view may be a way of helping others.” (P14)

The participants acknowledged that personal motivation and self-discipline are facilitating conditions needed for teachers to participate in online professional development programmes. If you are not well-disciplined, it will be difficult to follow online courses such as a professional development course. The course content should meet teachers’ needs to increase their motivation to follow such courses.

“The teacher must be motivated.” (P33)

“Motivating factors such as time for studying and finance in cases where the course is not free.” (P32)

“It is impossible to do a course online if you are not well-disciplined (self-discipline).” (P14)

“Willingness to connect to the internet and study.” (P13)

The most important condition to facilitate teachers’ engagement in online professional development is infrastructure to connect to the internet. Today a ubiquitous device will be more appropriate. Teachers can access the resources anywhere at any time without worrying about which type of device they have.

“Infrastructure such as internet connectivity and a connecting device.” (P31), (P34)

One participant stressed the point that not all teachers have a computer with an internet connection at home or even at school. Teachers should have the opportunity to get access to internet both at home and at school. They will then be able to access information when needed, thus decreasing the gap between digital immigrants and digital natives.

“In 2015, do all Mauritians have access to internet facilities? Not even all teachers have access to internet. Not all teachers have the same facilities regarding internet access. We get the same problem as for traditional professional development.” (P22)

Another condition that may influence teachers’ beliefs about online professional development is the ability to perform other activities, such as household tasks or private tutoring, among others. Teachers can be performing such activities while engaging in professional development activities. Private tutoring is a major activity in the Mauritian educational system. Teachers tend to invest their time in such activities for financial purposes, as they can get more money than their monthly salary. One participant adds that it is not encouraging to engage in professional development activities “if you do not get any motivation for doing this” (P33). Another participant argues that “we are not praised enough” (P34), once completing a professional development programme, for the investment made in studies for professional development. These facilitating conditions can be in terms of the availability and accessibility of resources. There is no need to be in the same physical place at the same as the site now is the internet.

5.5 Challenges of online teacher training

5.5.1 Implementation

A teacher acknowledged that even if online learning has many benefits, teacher training “cannot be only online” (P33). There should be different forms of professional development programmes for teachers as they may need different approaches to professional development at different stages of their career.

Another point raised by the participant was how to integrate the practical side in online teacher training courses. In online teacher-training programmes there is no class visit from the tutor in a real school context. Teachers would have all the resources considered necessary in traditional teacher training together with those in online teacher training if the two modes of training could be combined. The participant is thus proposing a blended system for teacher training.

“Practical side as it is important, you get only online.” He also added that what is done in PGCE courses must be integrated into online courses, that is:

“include the practical part also, I think a teacher for example needs also to get what is done in PGCE courses, where there is how do you call it. Where the tutor comes and explains a little, and can show a video tape also (micro teaching).” (P31)

A teacher pointed out that even though there were no practical sessions and class visits, the online course was one of the best. It does not depend only on whether there were practical sessions or class visits for the training programmes to be effective. Teachers’ experiences with the training programmes and their expectations regarding the course are important factors that need to be considered.

“Because, it is among the best course although there was no class visit session ... in the past eight years, it was one of the best courses I followed.” (P34)

Thus, the way online teacher training is implemented is very important. We must not replicate what we have in face-to-face programmes in OPD. As teachers’ PD must be more practical oriented. But in spite of being free, formal as well as informal OPD need to be recognised.

5.5.2 Formal and informal learning

Study participants stressed the point that their learning must be recognised, whether formal or informal. Recognition of their learning experiences would boost them to participate more in teacher professional development courses. The recognition could be in the form of promotion or salary increase as they have invested their money. They added that the investment is for the benefit of their students and, eventually, the school. They are not refunded as school is not considered as a profit-making business. But if schools were profit-making businesses which contribute to HRDC, the employees would have been refunded whenever they go for professional development courses. This is the case for other sectors which are registered with the HRDC which operates under the aegis of the Ministry of Education and Human Resources, Tertiary Education and Scientific Research: the employees are refunded up to 50% of the sum invested in professional development programmes. Teachers must be valued, supported and treated as professionals. Therefore, as teachers are not refunded and do not get a salary increase after the completion of professional development courses, they prefer to do other activities which are remunerated, like private tuition after working hours, rather than attend professional development courses. But

teachers share their ideas whenever they can, like when having a coffee or during an exchange in the corridor or in the staffroom. These discussions are more fruitful for them than in training sessions which are not the best place for meaningful collaboration.

“Is it recognised? Is there anything at the end ... that is will I get a certificate or a salary increase? Possibility of promotion where you can see you are evolving [progressing].” (P34)

“In the educational system there is not enough praise and encouragement for teachers apart from their personal desire to follow professional development courses. Teachers expect to get recognised after the completion of a professional development course ... Yes because you are investing but for whom, for the school, for your students, government, but the parastatal body does not recognise this, you understand ... There must be sustainable government actions to change teacher education policies. That is find ways to encourage teachers to undergo professional development activities.” (P33)

“Must get at least Rs5000 when you have to follow a course/training for your professional development as teacher” (P31)

“How much increase will you get on your salary?” (P35)

When teachers decide to engage in PD programmes, the main question they ask before, is whether it is recognised with a salary increased. But to have a possibility to be recognised, the OPD programmes must be well-structured.

5.5.3 Course structure

Part-time training courses are the only major way for teachers to keep up-to-date. These courses can be once-off workshops or certification courses which extend over years. The workshops sometimes are delivered during working hours or during school holidays, while the awarding courses are offered after school hours. Teachers have to travel to the institution to attend the course. These external constraints such as travelling time reduce teachers' academic productivity in courses. Therefore, alternative ways of learning must be implemented to facilitate access to professional development courses. But these courses must be user friendly. One participant claimed that online courses are not well-structured and not user friendly. It is difficult to move around the web pages to get the required resources. Another participant agreed with this argument that online courses are not

structured. The web page must be structured in such a way to prevent the waste of time in searching and identifying the task itself. If more energy is wasted in identifying the task, the user will be discouraged. The course is not well-structured.

“Online courses are not structured sometimes.” (P32)

“Yes that’s true.” (P33)

However, one participant maintained that it depends on the institution, as where she is registered as student, the course is well-structured. Also there is a good relationship between the student and the tutor. Therefore, there must be a common standard for all institutions offering online courses. The user has to feel comfortable in any learning environment in whichever institution he or she is registered.

“I am already doing a course online, and I think that it depends with which institution you are doing the course, if an institution is very professional the course structure will be well defined and user friendly” (P25)

The teachers felt treated as their own students when they went to training courses. The issue, here, is who trained the trainers. Some of the trainers were former teachers. They just do whatever they were doing in their classes. Teachers are “same as the students.” (P33)

As teachers are afraid of the unknown, the courses need to be structured in a way where less effort is needed to complete the activities. Such system must look like the common apps that teachers are actually using.

5.5.4 Unfamiliarity

A participant acknowledged that teachers are afraid of the unknown. Most teachers are not used to online learning as they have always evolved in the traditional learning environment. Teachers with many years of experience tend to find it tough to find their way in an online environment. They must first learn how to download or upload materials, or even search on the web. The user needs to acquire the basic concepts of the internet conventions as this may cause a refractive attitude towards online learning.

“Exactly I always go towards what I know, rarely towards what I do not know, towards unknown. The unknown frightens me ... the users must know the ‘code’ while using

internet ... for example how to download materials or upload assignment on the internet.” (P21)

As technology has been imported to the local context, it has to be adapted. The internet was mainly used for entertainment and for searching for information only. Educational institutions have not taken advantage of such devices from the beginning. On the contrary, educational institutions have limited the use of internet in the educational field as it was seen as a leisure tool and teachers were afraid of being replaced. Furthermore, no education was provided at the national level to sensitise people about the benefits of using such a device in teaching and learning since the beginning. It seemed to be the reason why teachers are not using the internet, especially the social media, for educational purposes, but mostly as a leisure tool. When using social media as a leisure tool, people learn from their peers; for example, people can ask their peers how to upload or download photos from Facebook. But, when it came to the use of the internet for learning, people found it more difficult to learn from their peers.

5.5.5 Human contact

The participants argued that human contact is very important in education as, without it, some aspects of the learning environment will be erased. But the rapid growth of ICT has greatly influenced the way we live, communicate, do business, socialise, work and learn. People use local area networks and wide area networks, for example the internet, to access large amounts of information. Physical human contact is no longer mandatory. In online learning, human contact has changed form: webcam can be used or as in augmented reality you can have the hologram. This new form of contact is emerging in the educational sector.

“I think in education human contact is very important and online will erase certain aspects, how would I say, it will erase the propitious learning environment.” (P14)

Another participant in focus group three argued that even if there was no human contact in the course, she loved it because it was very rich. It can be concluded that human contact is not a barrier while learning online, as the user enjoys what is obtained as experiences and resources. In online learning it is more about digital presence than physical contact.

“I saw it so rich ... although it was for a short duration, I really I loved the online course. There was no physical contact but I still enjoyed it.” (P34)

In comparison to face-to-face PD delivery, OPD has removed the human aspect which one participant in focus group one saw as being important in education. But another participant in focus group three, has pointed that she has loved the online course. When using technology for a long period of time, people can have health problems such as repetitive strain injury.

5.5.6 Health problems

One of the participants stressed the point that she cannot stare at the computer screen for too long. His/her eyes become painful, which is one of the health problems related to computer usage. A computer user can have different health problems while using this tool for long periods of time. These health problems can be back pain, eye strain and repetitive strain injury. There are some precautions that must be observed while using ICT tools, for example, taking regular breaks, which should be included as guidelines in the online courses

“I prefer hardcopy as I have eyes problem, I cannot concentrate on the screen for too long. When I stare at the screen for more than one hour, my eyes become painful in the long run.” (P24)

Even with the advance in technology, there are still some people who prefer hard copy, which they are used to. Besides, the health problems which OPD can cause, another disadvantage of OPD is that the learner needs self-discipline which is a crucial factor.

5.5.7 Self-discipline

Teachers will have to be self-disciplined when they register for any online professional development course. Self-discipline is a sine qua non when enrolling for an online course, according to the participants. As online learning is a self-directed leaning approach, the user must be adequately informed about the implications since this is an emerging way of learning. The users must learn how to balance learning time and leisure time.

“And also discipline, self-discipline, if you do not have this, you cannot do a course online. It is impossible. You must have a good discipline, and you need to have a time to work.” (P14)

Another participant explained her bad experiences with online learning. She did a module for her Bachelor degree online. She was alone in the online learning environment. Sometimes she did not know what to do and when to do what. She never saw her lecturer. The institutions must ensure that the students are ready enough to engage in online courses.

“I did a class like this at the university. I never saw my teacher. Although we had examinations, I never saw the corrected versions of the questions we had done as assignment.” (P25)

The participants claimed that teachers tend to isolate themselves due to social influences, as they are afraid of being judged by their colleagues. They do not come forward to share what is happening in their class. They fear the comments of their peers. Online learning must cater for this type of learners. One way to cater for shy teachers is to provide the possibility of being anonymous, as teachers can express themselves anonymously in an online learning environment. This can provide a space for teachers to really describe what happens in their classes. Their peers can suggest solutions to their problems.

“When it becomes talk of town [gossip].” (P11)

“This is true, gossip can lead to an issue. Even if these teachers have offers for professional development, they prefer not to go forward maybe ...when you are online ... maybe also, the fact that ... we don't consider the fact that many teachers don't describe what happens in the class, for fear of being judged, not being understood.” (P13)

The learner needs self-discipline which is an important element while engaging in online professional development. The learner needs to find a balance between the learning and leisure activities. The learner must be honest enough to submit only their own work.

5.5.8 Authenticity of teachers' work

A participant acknowledged the fact that students in an online learning environment can easily cheat. They can copy/paste their friends' work or even ask their friends to do the

work for them. The participant claimed that in online courses it is difficult to ensure the authenticity of students' work, for example, a student can upload assignments which can be someone else's assignment and not the registered person's. This will discourage people from enrolling in online courses. But if all institutions that offer online courses apply the same rules, people will be more willing to register in online courses. One of these rule could be if any plagiarism is detected in any student's work, the student fails the module and cannot submit any task with the same topics; even though the plagiarised part has been removed.

“But there is no guarantee that the work that I sent is mine. I can ask my cousin or friends to do this assignment for me, or I know someone who has done this assignment before, I ask for a copy, I change the name.” (P21)

The participant stressed the point that the institutions must be able to verify the students' identity as there is a lack of control in the current online courses provided by these institutions. To increase the trustworthiness of teachers, a webcam can be used to compare the picture of the user with what is stored in the database during registration. Plagiarism software should also be used to detect the authenticity of the submitted work. This could be another security issue added to the existing ones. The user must be given a username and a password. Therefore, the online learning system will become more credible, thus increasing the enrolment rate.

I send the work, who can verify whether it is really mine. At the end, I get my certification.” (P21)

One of the major challenges of online teacher-training programmes is how to verify the authenticity of the work submitted. It is difficult to know whether it was the same person who have submitted the work. One way to reduce such risk, is to review the structure of TPD curriculum.

5.5.9 Curriculum constraint

Teachers are now restricted by the curriculum; therefore, there is no time to devote to the affective domain of the students. The educational system is creating consumers of curriculum. Thinking that they are doing their best, different governments during the past few years have tried to reform our education system. The government has now introduced

what the researcher considers “constraints” in our educational system, for example, quality assurance, which is a good thing on its own, but how it is applied in education is very important. As teachers are more and more accountable now they tend to do what is in the curriculum only and also finish it in the given time independent of whether the students have grasped the concepts or not. Hence, teachers do not have the time to create a conducive environment for the learners to learn.

“Therefore management will ask you why students have not worked, why the class has not worked, you have to explain.” (21)

“Mostly in Mauritius, it can be just cognitive aspect, mostly cognitive thing, mental, intellectual aspect that is favoured but the emotional aspect, psychological aspect of the learner is not being taken into consideration.” (P23)

The reform is towards the holistic development of the child, but its implementation is restricted by the curriculum which the teachers have to cover in a given period of time. This is because the society and the system in general are more examination oriented. The resources may be available but if there is not enough time to use these resources, the resources become useless. Education cannot be holistic if the education system is guided by the curriculum. The system and the curriculum need to be reviewed so that it can cater for different learners and enable them to develop different skills. The system must emphasise morals and values as an integral part in education in all the schools to help the learners to be better persons in the society. Otherwise holistic education will remain only a wish if funds, proper infrastructure, ongoing professional development programmes and research are not available to all stakeholders engaging in the system.

“Only one way of learning, and they are expecting to help developing the capacity of the children.” (P21)

“But unfortunately we have time factor. We are limited to time factor so meaning that we have the theories but we do not have time to apply them in the classroom situation.” (P22)

The same situation occurs in teachers’ professional development courses which have to be finished in a given time and then the teachers go through the examination process. So, teachers tend to learn only for the examination rather than acquiring strategies to improve

their teaching. Sometimes teachers find these courses very demanding and challenging to complete, so they quit. This situation may be due to the structure of the course, as the teachers have a given module in which there is coursework to be submitted while at the same time doing their teaching. Having looked at these themes that have emerged and discussed, we turn now to a revised conceptual framework.

5.6 Updated conceptual framework

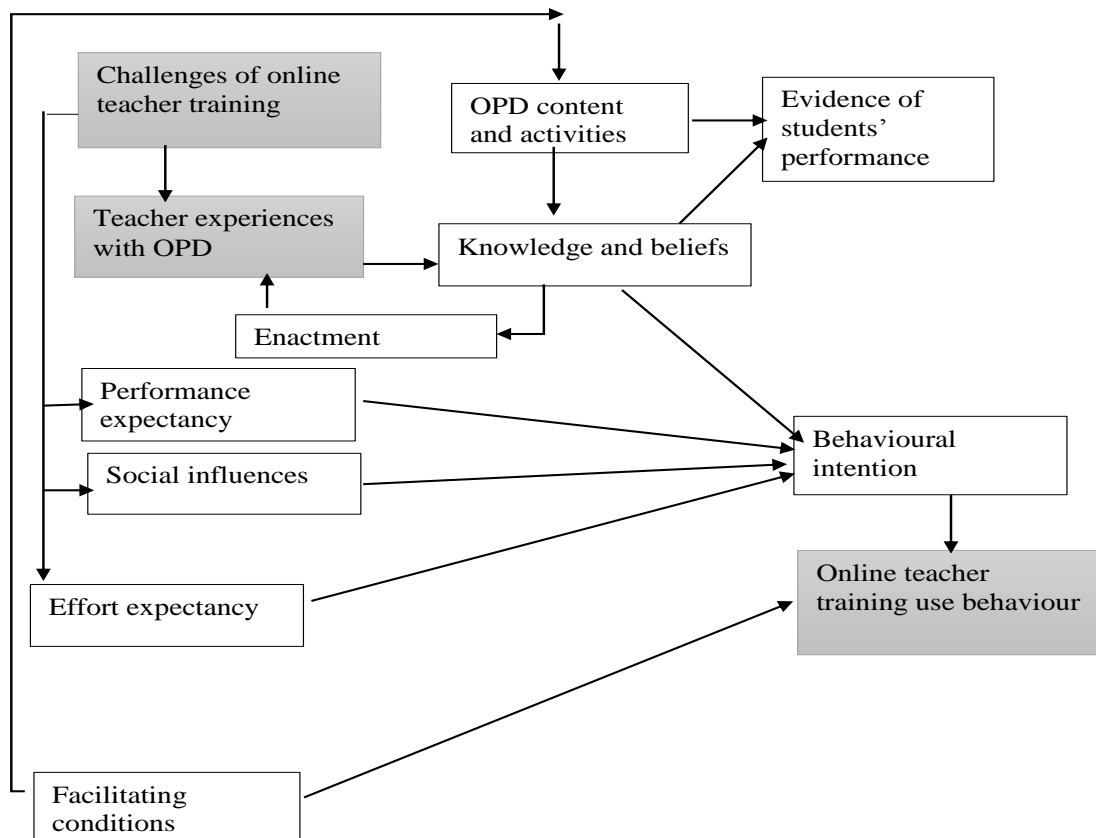


Figure 5.1: Proposed model of OPD (CF 2)

The previous model proposed in the conceptual framework was refined after the analysis and discussion of data. The construct challenges of online teacher training are added to the new conceptual framework as they shape the knowledge and beliefs of teachers towards online professional development. As the factors of professional development design elements (sites, strategies, media and content) form part of the facilitating conditions variable, they have been removed from the conceptual framework. Challenges of online

teacher training influence teachers' experiences with OPD and the facilitating conditions. Therefore to change teachers' knowledge and beliefs, focus should be on factors challenging OPD while designing online teachers' professional development.

The four constructs from UTAUT model are defined as follows:

Performance expectancy focuses on the belief that the use of OPD will help to improve teachers' work. It includes interactivity and flexibility.

Social influence refers to the degree to which a person perceives as essential that others (like the boss, peers) consider that he or she should use OPD.

Facilitating conditions refer to factors that the users consider to be present as support in using the technology (Venkatesh et al., 2003) in our case OPD, for example, training, technical support, peer or instructor support and any additional resources. The following factors are included in this variable: sites, openness, accessibility and availability and private tutoring.

Effort expectancy is still an important construct in the conceptual framework as the participants in the study describe the online learning system as being unstructured and that they are not accustomed with such system even though, we are living in a digital age and teachers are using technology such as smartphones in their everyday life. Researchers summarise effort expectancy as a combination of Perceived Ease of Use (Davis, 1989; Davis et al., 1989), Complexity (Thompson et al., 1991), and Ease of Use (Moore & Benbasat, 1991). In this study the complexity of the online professional development programmes is due to the unstructured of the system. Perceive Ease of Use and Ease of Use refer to the user's unfamiliarity with the system.

OPD content and activities are the same as professional development design elements construct taken from the model of teacher learning. While designing OPD, the elements to be taken into consideration are the content and the activities, which are influenced by teachers' experiences with OPD. Experience is one of the five control variables present in UTAUT model.

Challenges of online teacher training are the elements that online training institutions and educational stakeholders need to consider while designing, implementing and offering online teacher professional development. These challenges of online teacher training directly affect teachers' experiences with OPD, effort expectancy, performance

expectancy, social influences, in addition to teacher's knowledge and beliefs about online professional development usage as shown in Figure 5.1.

Teachers' experiences with OPD refer to elements influencing teachers' usage of online professional development. In this study, these factors are social influences, facilitating conditions, challenges of online teacher training, performance expectancy, effort expectancy and evidence of students' performance. Teachers' experiences with OPD affect teachers' knowledge and beliefs about OPD, which directly influence teachers' usage of online teacher-training programmes.

Knowledge and beliefs refer to teachers' paradigm about teaching and learning. The paradigm is constructed through the knowledge teachers acquire during their careers and their beliefs about teacher professional development, for this study more specifically about OPD. Their knowledge and beliefs affect their behavioural intention to use OPD, thus affecting their usage of online teacher-training programmes.

Thus, when designing teacher professional development, we must take into consideration the nine independent variables and the two dependent variables, which will affect the content and activities of OPD. This is because in a learner centred approach system, teachers' experiences with OPD will influence the content and activities in an OPD programme. In Figure 5.1, the size of the boxes showing the different constructs, does not indicate their importance in the framework.

5.7 How phase 1 informed phase 2

The initial phase was to explore the phenomenon, the secondary school teachers' beliefs about OPD, while the second phase was to generalise the findings to a bigger sample. The intention of using a mixed methods approach in this study was to extend the result from the qualitative phase to develop the quantitative instrument to measure teachers' belief about online professional development. Instrument measuring beliefs perceived by teachers about online professional development can be created through qualitative inquiries; and the quantitative approach can be used to test for significant relationships (Bryman, 2004). Phase 2 included testing and administering of the instrument which was a questionnaire adapted to the sample in the study. The instrument intended to assess what constructs should be measured to better understand the beliefs of teachers towards OPD. The conceptual

framework was updated according to the results obtained in phase one. The three emerging themes as shown in Table 5.1 were used to create the additional constructs of the new conceptual framework. The related sub-themes have been grouped under these constructs: teachers' experiences with OPD, challenges of online teacher training, content and activities and evidence of students' performance. The questionnaire was developed according to the themes that resulted from qualitative data and was consistent with the revised conceptual framework. Constructs have been removed if they seemed less pertinent and new ones have also been added (they have been filled with colour). Removal of the constructs was also due to the fact that the participants had not provided any relevant issues regarding a given construct even though the researcher expected such issues to be raised through the question set during the focus group interview. The qualitative data from the 15 teachers interviewed informed the generation of hypotheses regarding factors potentially associated with teachers' behavioural intention to use online professional development and their beliefs about online professional development (Curry et al., 2011). Themes and codes comprising the categories were derived from the qualitative data sets, which served as individual survey items. It is important to note that not all codes were represented as survey response items. Only the items that were most represented in the qualitative data sets were selected as survey response items so that the survey remained as short as possible and measured only the most significant constructs from the qualitative data sets. The matrix table in Appendix I shows how the qualitative approach is related to the quantitative approach. It also shows how the emerging and sub-themes are related to the statement of the instrument used in the quantitative approach.

5.8 Synthesis

This chapter provided an outline about the qualitative data analysis procedure and a description of the three main emerging themes and the sub-themes. The first theme was teachers' experiences with teacher-training programmes and comprised seven sub-themes. The second theme was online teacher-training use behaviour and consisted of four sub-themes. The third theme was challenges of online teacher training, which consisted of nine sub-themes. The last two sections provide a revised conceptual framework and an explanation of how the first phase informed the second phase. An instrument would be

developed from these findings to collect data from the respondents of phase 2, the quantitative approach. This approach would be used to get an overall picture of the case. The factors that influence online professional development usage are: the content in relation to theory and practice one-size-fits all, course duration, professional growth and progress, student performance, social influences, school context, teachers' conception about online learning, motivation, benefits of online teacher training, facilitating conditions, implementation, recognition of informal learning, course structure, unfamiliarity, human contact, health problems, self-discipline, authenticity of teachers' work and curriculum constraint. The qualitative approach had also shown how these beliefs are constructed. The qualitative approach has provided a deep understanding of the topic. The next chapter, the quantitative approach, investigates the relationship between these variables.

CHAPTER SIX: QUANTITATIVE ANALYSIS

6.1 Introduction

The previous chapter has offered a description of the findings of the qualitative phase of the study. This chapter will be about the quantitative analysis. It consists of six sections. **Section one** gives a brief overview of the chapter. **Section two** is about analysis of quantitative data. **Section three** provides a background and the profile of the respondents. **Section four** gives a descriptive statistic of the themes that emerged from the qualitative approach. **Section five** deals with multiple linear regression analysis showing the association among the variables. **Section six** is a summary of the chapter.

The analysis is presented in two parts – descriptive analysis and inferential analysis. Frequency distribution was among the descriptive statistics used to summarise the variables. Multiple regression was used to explore the association between the dependent and the independent variables. It was also used to explore to what extent the relationship between these variables enables or inhibits teachers' beliefs about online professional development. The initiative of this quantitative approach was to use the theoretical constructs located in the literature review chapter and the themes resulting from the qualitative approach, to examine whether or not the variables listed above have a relationship with online teacher training use behaviour. The findings are introduced as brief discussions and in form of table.

6.2 Instrument reliability

To measure the internal consistency of the survey instrument, the Cronbach's Alpha value was calculated (Nardi, 2003). This survey contained items which measured variables related to teachers' beliefs about online professional development and factors affecting teachers' beliefs about online professional development. There were 11 constructs:

1. knowledge and beliefs of secondary school teachers;
2. online professional development activities and content;
3. enabling factors for online professional development;
4. challenges of online professional development;
5. performance expectancy;
6. teachers' experiences with teacher-training courses;

7. social influence;
8. effort expectancy;
9. behavioural intention to use OPD;
10. evidence of students' performance; and
11. online teacher-training use behaviour.

Cronbach's Alpha value was used to measure the internal consistency of each section; the range of the reliability coefficient is between 0 and 1. But, in reality, the coefficient has no lower limit. The internal consistency of the items in the scale depends on how close the Cronbach's alpha coefficient is to 1.0. An Alpha value closer to 1.0 means greater the internal consistency in the scale. The following rule of thumb was provided by George and Mallery (2003): "> .9 – Excellent, > .8 – Good, > .7 – Acceptable, > .6 – Questionable, > .5 – Poor and < .5 – Unacceptable" (p. 231). The internal reliability coefficients of all the scales were acceptable as their alpha values were beyond the commonly accepted minimum of .70 (George & Mallery, 2003; Nunnally, 1978). For the 11 scales within the survey, the overall alpha coefficient was $\alpha = .92$. All the questions regarding the variables were answered. Table 6.1 shows a summary of the alpha values showing the instrument reliability.

Table 6.1: Instrument reliability results

Constructs	Number of items	α	M	V	SD
OPD activities and content	13	0.8	30.03	38.94	6.24
Facilitating conditions	22	0.84	35.86	67.78	8.23
Challenges of OPD	19	0.83	39.28	66.49	8.15
Performance expectancy	13	0.84	26.82	40.15	6.34
Teachers' experiences with OPD	19	0.85	42.34	70.4	8.41
Social influences	11	0.85	26.58	37.62	6.13

Constructs	Number of items	α	M	V	SD
Effort expectancy	13	0.72	28.4	28.5	5.34
Evidence of students' performance	15	0.75	33.34	41.13	6.41
Knowledge and beliefs	18	0.7	40.34	49.7	7.05
Behavioural intention	12	0.74	28.18	34.81	5.9
Online teacher training usage	17	0.88	41.6	89.81	9.44

6.3 Descriptive statistics

In this section, an overview of the characteristics of the respondents is given. Therefore, data regarding the respondent's profile, enrolment in PD and OPD courses, understanding of teacher professional development and internet access. Frequencies and percentages are used to represent the results for better understanding.

6.3.1 Respondent's profile

With a view to putting the data within a meaningful context, the background of the responding secondary school teachers is presented first. There were 12 (18.5%) participants in Maya secondary school and 53 (81.5%) in Sam secondary school making a total of 65 respondents. The survey covered a variety of relevant issues which included respondents' demographic information, understanding of teacher professional development, facilitating and inhibiting factors of using online professionally, performance expectancy, teachers' experiences with teacher-training courses and social factors. The participating teachers were made up of 30 (46.2%) females and 35 (83.8%) males teaching a wide range of subjects such as Languages, Mathematics and Science, Commerce, Design and Technology, Information Technology and Physical Education, their teaching experiences ranging from 0 to 20 years

of experiences. This wide pool of respondents enabled the researcher to scrutinize the beliefs of teachers towards OPD in a wide range of subjects.

Table 6.2: Respondents' profiles (n=65)

Variable	Values	N	Percentage
Gender	Male	35	53.8
	Female	30	46.2
Age group	20-29	14	21.5
	30-39	36	55.4
	40-49	10	15.4
	50+	5	7.7
Teaching experiences	0-5	19	29.2
	6-10	13	20.0
	11-15	22	33.8
	16-20	2	3.1
	20+	9	13.8
Qualification	Diploma	9	13.8
	B .Ed	11	16.9
	First Degree	22	33.8
	PGCE	12	18.5
	Master	11	16.9
Subject	Information technology	2	3.1
	Physical education	8	12.3
	Commerce	10	15.4
	Design and technology	11	16.9
	Language	15	23.1
	Mathematics and Science	18	27.7
	Total	64	98.5
Missing	System	1	1.5

Table 6.2 shows the profiles of the respondents. The participants' age varied from 20 to over 50. The range of 30 to 39 represents the largest group in the sample (n=36; 55.4%).

Out of the 65 respondents, more than 60% were women from age group 30- 39, and more than 40% males were from age group of 30- 39, while 9 (13.8%) men were in the age range of 20 to 29.

The results in Table 6.2 show that 55.4% of the teachers in this sample were in the age group of 30 to 39 years and 23.1% of the respondents were above 40 years old. The respondents above 30 years old are classified as digital immigrants and those who are less than 30 years old are in the group of digital natives. Teaching experience with the highest percentage (33.8%) is in the range of 11 to 15 years and 29.2% in the range of 0 to 5 years. In this study, 83% of the teachers in the sample have teaching experience of 0 to 15 years.

The respondents were requested to specify their highest qualification. The majority of the respondents (33.8%) had a first degree not related to education, followed by PGCE (18.5%). Master's degrees and B. Ed had the same percentage (16.9%) while 13.8% of the respondents had a diploma. While analysing the data closely, it showed that only 16.9% of the respondents had had pre-service training and 18.5% had in-service teacher training.

These respondents teach a broad range of subjects as shown in the Table 6.2. Physical education teachers account for 12.3% of the respondents. Languages which account for 23.1% include French and English. Mathematics and Science which comprise Mathematics, Science and also Food Science is 27.7%. Most of the participants taught subjects which students have difficulties to master. Commerce which is 15.4% includes subjects like Accounts, Business Studies, Economics, Social Studies and Travel and Tourism. Design and technology which is 16.9% of the respondents include Art and Design and Design and Technology/Communication.

Table 6.3: Crosstabulation – teaching and qualification

		What is your highest qualification?				
		Diploma	B. Ed	First Degree	PGCE	Master
For how long have you been teaching?	0-5	3 (4.6%)	5 (7.7%)	6 (9.2%)	3 (4.6%)	2 (3%)
	6-10	3 (4.6%)	1 (1.5%)	6 (9.2%)	3 (4.6%)	0
	11-15	2 (3%)	4 (6.2%)	8 (12.3%)	4 (6.2%)	4 (6.2%)
	16-20	0	0	0	1 (1.5%)	1 (1.5%)
	20+	1 (1.5%)	1 (1.5%)	2 (3%)	1(1.5%)	4 (6.2%)

Table 6.3 shows that some teachers do not upgrade their initial qualification even after 15 years of teaching experience. They are still with their first degree, one of the requirements to teach in secondary schools; out of the 33.7% who have a first degree, 21.5% have teaching experience of between six and 15 years. Table 6.3 reveals that 49% (Diploma, B.Ed. and PGCE) of the teachers had an initial teacher-training course and only 18.4% had gone through an in-service training leading to a PGCE after their first degree. Teachers having PGCE and Master’s Degrees had the highest percentages (50%) and their teaching experience spanned from 16 to 20 years. Furthermore, about 45% of teachers who had above 20 years of experiences had a Master’s degree. It has been observed that as teachers gain more and more teaching experience, they tend to have higher qualification. On the other hand, more than 20% of teachers who have teaching experience ranging from six to 10 years still have a diploma.

6.3.2 Enrolment in PD and OPD courses

During the past five years, 41.5% of teachers participating in the phase two of this study had not followed any professional development programme, indicating that many teachers are not lifelong learners. Only 16.9% of the teachers were currently following a PD programme. Even though 67.7% of the respondents are confident with their online learning skills, only 21.5% of the teachers have followed an online professional development course.

The providers of online teacher training need to ensure support for teachers engaging in such programmes as 32.3% of the teachers view their online learning skills as beginners

who need support. From the 67.7% of the respondents who feel confident about their online learning skills, the majority were males (77%) (see Table 6.4). From the 65 respondents only 14 (21.5%) have followed an online professional development course in their career. Most, 51 (78.5%) participants have not participated in an online professional course even though they have access to the internet.

Table 6.4: Technical support for OPD and involvement in PD

Variable	Values	N	Percentage
Need technical support for OPD	Strongly agree	25	38.5
	Agree	21	32.3
	Neutral	12	18.5
	Disagree	5	7.7
	Strongly disagree	2	3.1
Involvement in PD	Following PD course during past 5 years	38	58.5
	Currently following PD course	11	16.9
	Followed any OPD course	14	21.5
Online learning skills	Beginner with support (M=8; F=13)	21	32.3 (M=23; F=43)
	Confident on my own (M=27; F=17)	44	67.7 (M=77; F=57)

Table 6.4 shows that 38.5% of the respondents strongly agreed and 32.3% agreed that they would need technical support if they were to engage in an online professional development programme. Only 10.8% disagreed with the provision of technical support if they are to engage in an online professional development programme as shown in Table 6.4. Therefore, technical support must be provided to encourage teachers to take part in online professional programmes.

6.3.3 Understanding of teacher professional development

Table 6.5: Teachers' understanding of teacher professional development

Items of measurement	Percent response	Frequency
Opportunities to share experiences and resources with colleagues, discuss with colleagues.	9.8%	48

Life-long learning.	9.4%	46
Training to help teachers in managing their classes.	9.2%	45
Following courses to learn new teaching techniques, theories and other experiences.	9.2%	45
Helping teachers in mastering their subject.	9.0%	44
Acquire teaching and pedagogical skills to improve teachers' work.	9.0%	44
Attending workshops.	6.9%	34
Training related to your working context.	6.1%	30
Learning different educational theories.	5.9%	29
Following educational courses.	5.9%	29
Attending short educational courses.	5.9%	29
Follow award online educational courses on the web.	5.3%	26
In-service training.	4.9%	24
Follow non- award online educational courses on the web.	3.5%	17

Table 6.5 shows teachers' views about teacher professional development. Most of the teachers indicated that teacher professional development must provide the following six objectives: opportunities to share experiences and resources with colleagues; discuss with colleagues; lifelong learning; training to help teachers in managing their classes; follow courses to learn new teaching techniques, theories and other experiences helping teachers in mastering their subjects; and acquire teaching and pedagogical skills to improve teachers' work. While only 3.5% of the respondents viewed following of non-certificated educational courses online as teacher professional development, and even if it is a certificate course, only 5.3% of the teachers agreed that following online educational courses is a form of teacher professional development.

6.3.4 Internet Access

Table 6.6: Devices used and access location of internet

Device use	Frequency	Percentage
Tablet PC, laptop and Smartphone	24	36.9
PC, Tablet PC, Laptop and Smartphone	17	26.2
Smartphone	3	4.6

PC	5	7.7
Laptop	16	24.6
Access location		
Home	24	36.9
Anywhere	21	32.3
Home and school	20	30.8

For the statement regarding what device/s teachers utilised to access the internet, 36.9% of the respondents said that they accessed the internet with tablet, PC, laptop and smartphone. Respondents using PC, tablet, laptop and smartphone account for 26.2%. It can be seen from Table 6.6 that 24.6% of the respondents used only a laptop. The respondents tended to use more portable devices to access the internet as only 7.7% used PC alone.

Table 6.6 shows that 36.9% of the respondents accessed the internet from home while 32.3% from anywhere using their portable devices. Only 30.8% did so both at home and at school. Some teachers did not access the internet at their workplace. As shown in Table 6.6 every respondent had access to the internet. But only 63.1% of the teachers could access the internet at school. Therefore, for teachers to have access to readily available resources at their workplace and also connected to their peers, they should be able to have internet access anywhere. But the results seem to show that internet connection is not a predictor of online teacher-training usage.

Table 6.7: Crosstabulation – age group and frequency of accessing internet

What is your age group	How often do you access the internet?								Total
	Daily (1-2 times)	Daily (3-4 times)	Daily (more than 5 times)	Weekly (1-2 times)	Weekly (3-4 times)	Weekly (more than 5 times)	Monthly (1-2 times)	Monthly (3-4 times)	
20-29	3	1	8	1	0	1	0	0	14
30-39	8	4	17	3	2	1	0	1	36

	40-49	2	2	4	0	0	0	2	0	10
	50+	1	0	4	0	0	0	0	0	5
Total		14	7	33	4	2	2	2	1	65

Thirty-three (50%) of the respondents accessed the internet more than five times daily irrespective of their age group as shown in Table 6.7. Of respondents aged between 20 and 29, eight out of 14 accessed the internet more than five times daily. While those who were between 30 and 39 years it was 17 out of 36. Moreover, four out of five respondents (80%) of those who were 50 years and above accessed the internet more than five times daily. This means that regular access to the internet is not dependent of age. The more you access the internet, the more you become familiar with online learning environment.

6.4 Inferential statistics

The purpose of this section is to explore the phenomenon through quantitative data to find out whether these data could be used to justify or not the themes that emerged from qualitative approach. The items were organised in the same sequence as in the questionnaire. The next set of tables (Table 6.8 to Table 6.14) present the constructs with their corresponding items of measurement and the frequency of agreement and disagreement for each item. For the ease of reference and understanding, the strongly agree and agree have been summed to give one value and labelled as agree. Similarly, the strongly disagree and disagree have been summed and provided as one value and labelled as disagree. The section is organised according to the theme and their corresponding sub-themes obtained from the qualitative approach, starting with teachers' experiences with teacher-training programmes, through online teacher training use behaviour and ending with challenges of online teacher-training.

Table 6.8: Beliefs of secondary school teachers towards educational system

Items	Agree	Neutral	Disagree
Aspirant secondary school teachers need initial teacher training.	90.8	6.2	3.0
All secondary school teachers should have had an initial teacher-training program.	90.8	6.1	3.1
The trainers should be trained.	93.8	3.1	3.1

Items	Agree	Neutral	Disagree
Educational reform should focus on teacher's professional development.	73.8	20.0	6.2
There should be a Teacher Educational Council to regulate teachers' licences.	56.9	33.8	9.3
Teacher professional development should be compulsory throughout my career.	66.2	24.6	9.2
All secondary schools should be managed by only one agency.	44.6	23.1	32.3
Promotion should be only in terms of seniority.	35.4	23.1	41.5
Teachers continue with spoon-feeding approach despite the trainings obtained.	46.2	26.2	27.6
The spoon-feeding approach promotes competition instead of cooperative learning.	44.6	29.2	26.2
For teachers to be creative and innovative, the mode of assessment must be changed.	86.2	12.3	1.5
The schools must provide opportunities for teacher professional development.	92.3	7.7	0.0
The school must allocate time slots for collaboration among teachers.	92.3	6.2	1.5
Teacher professional development should be embedded in teachers' daily practices.	76.9	21.5	1.6
Learning must be more collaborative and engaging across all learning domains (cognitive, affective and social).	92.3	7.7	0.0
Teachers should be encouraged to carry out action research project to improve the education system.	66.2	32.3	1.5
Teacher professional development should be compulsory and with salary increase.	75.4	15.4	9.2
Teacher professional development should be optional.	49.2	23.1	27.7
Teacher professional development should be optional and with salary increase.	61.5	23.1	15.4

The items measure beliefs of secondary school teachers towards the educational system. Table 6.8 shows that among the 19 items measuring the construct, five items have percentages less than 50% of teachers who agree.

Table 6.9: Online professional development activities and content.

	Items	Agree	Neutral	Disagree
1.	Online courses can be an alternative to provide specific courses.	81.5	12.3	6.2
2.	The tasks in online professional development courses can be tackled by teachers of all ages.	67.7	27.7	4.6
3.	The content and activities in online professional development help me to improve my teaching.	76.9	20.0	3.1
4.	The content of online professional development courses is directly related to my work.	56.9	38.5	4.6
5.	Content in online professional development courses can be adapted to my school context.	60.0	33.8	6.2
6.	The content and activities of online professional development courses are readily available at my workplace.	32.3	30.8	36.9
7.	Can get access to other teachers' experiences in online professional development programs.	46.2	33.8	16.9
8.	I can get access to foreign experiences locally through online professional development programs.	66.2	21.5	12.3
9.	The content is continuously updated.	58.5	35.4	6.1
10.	The content can be used again and again.	63.1	32.3	4.6
11.	Even though teachers follow professional development courses, they continue teaching the way they used to.	60.0	30.8	9.2
12.	Online learning environment combines practice and theory.	61.5	30.8	7.7
13.	Teachers learn more through reflection and discussion about their own practices.	73.8	18.5	7.7

Table 6.9 shows that of the 13 items, 11 items get more than 56% of teachers who agree and only two items get less. This implies that content and activities are a predictor of online professional development usage. The item that got the highest level of agreement is online courses can be an alternative to provide specific courses (81.5%) whereas item “the content and activities of OPD courses are readily available at my workplace” got the highest level of disagreement (36.9%).

Table 6.10: Enabling factors for online professional development

Items	Agree	Neutral	Disagree
The school management values teacher online professional development programs.	38.5	44.6	16.9
Teachers can access resources related to their needs in online learning.	63.1	23.1	13.8
I can access resources at my ease anywhere.	63.1	18.5	18.4
I can access resources whenever needed.	60.0	20.0	20.0
Time is being provided for me to access professional development courses at my workplace.	41.5	24.6	33.9
The content of the courses / programs can be adapted to the local context.	61.5	29.2	9.3
The school provides facilities for me to access online professional development programs.	38.5	24.6	36.9
I have necessary resources to use the online professional development programs both at school and at home.	47.7	26.2	26.1
The ease for the user to accomplish basic tasks for the first time will encourage teachers to use online professional programs.	69.2	27.7	3.1
Specialised instructions concerning the online professional development are available to me.	47.2	33.8	16.9
Online professional development does not act as a barrier for teachers to offer private tuitions.	64.6	32.3	3.1
Professional development should be continuous and progressive.	80.0	20.0	0.0
Support is available to assist me with difficulties encounter in online professional development programs.	53.8	30.8	15.4
The trainer must be familiar with the school context.	78.5	16.9	4.6
Professional development must be more demand-driven.	73.8	23.1	3.1

Table 6.10 shows that less than 50% of teachers agreed with five of the 15 items have percentages. Thus, facilitation conditions can be a good predictor of OPD use behaviour. “Professional development should be continuous and progressive” got the highest level of agreement (80%) and no disagreement. But “the school provides facilities for me to access online professional development programs” got the highest level of disagreement (36.9%).

Table 6.11: Inhibiting factors of online teacher training

Items	Agree	Neutral	Disagree
Teachers will participate in online professional development courses of recognised institutions.	78.5	13.8	7.7
The courses must be well-structured for teachers to participate in online professional development programs.	87.7	10.8	1.5
The limitation of ICT infrastructure is seen as inhibiting the rate of use of online professional development programs.	73.8	21.5	4.7
The participants need self-discipline to be able to participate in online professional development programs.	70.8	26.2	3.0
Participants can have health problem while using ICT devices for a long period of time.	69.2	21.5	9.3
Privacy and security need to be provided to increase teachers' trustworthiness in online professional development programs.	83.1	15.4	1.5
Lack of trust in online professional development courses due to plagiarism.	64.6	27.7	7.7
As teachers are used to the old system (face-to-face), it will be difficult to move to the new system (online).	55.4	23.1	21.5
If there are no incentives such as salary increase/promotion possibilities, teachers will not participate in online professional development programs.	63.1	21.5	15.4
Imposing a one-size-fits all teaching and learning approach will likely lead to frustration and discontent.	67.7	27.7	4.6
The unfamiliarity with the internet convention (e.g. how to download or upload a task) causes a refractive action towards online courses.	69.2	18.5	12.3
Professional development curriculum should be adjusted according the teachers' range of behaviours and beliefs.	75.4	23.1	1.5
Teachers engage in professional development programs for certification to obtain promotion or salary increase.	60.0	32.3	7.7
Informal learning should be recognised as a means for long-life learning.	78.5	16.9	4.6
More learning take place through informal learning rather than through formal learning.	69.2	26.2	4.6
Online professional development should be recognised.	89.2	10.8	0.0
Teachers should be rewarded after completing a professional development course.	84.6	12.3	3.1

Items	Agree	Neutral	Disagree
Promotion is very limited in the secondary sector.	75.4	23.1	1.5
If there is promotion, it should depend on competency rather than seniority.	78.5	18.5	3.0

All 19 items in Table 6.11 have percentages higher than 55, representing teachers who agree. Therefore, inhibiting factors can be a predictor of teachers' intention to use OPD. More than 80% of the respondents, the highest rate, agreed that online professional development should be recognised. Whereas, the item "as teachers are used to the old system (face-to-face), it will be difficult to move to the new system (online)" got the highest rate of disagreement which is 21.5%.

Table 6.12: Performance expectancy

	Items	Agree	Neutral	Disagree
1	Online professional development resources promote creativity and innovative.	80.0	18.5	1.5
2	Online professional development courses allow me to network with other teachers.	80.0	15.4	4.6
3	Online professional development programs make it easy for me to find resources for my teaching.	76.9	20.0	3.1
4	Experienced teachers do not use ICT tool in their classrooms.	58.5	24.5	17.0
5	I can view online videos of other teachers to improve my practices.	73.8	18.5	7.7
6	I have access to other teachers more readily.	63.1	26.2	10.7
7	Online learners must be autonomous and interactive, self-motivation and self-discipline, and have a high level of integrity.	80.0	12.3	7.7
8	Online professional development programs have help teachers to improve their teaching.	73.8	23.1	7.7
9	The more teachers perceive that online professional development programs have improved their work, they will be more likely to use them.	81.5	15.4	3.1
10	Teachers' beliefs about online professional development programs and its potential to facilitate their professional learning are more likely to influence teachers' decision to use online professional development facilities.	76.9	23.1	0.0
11	Professional development which is more directly related to teachers' needs will more likely to improve their daily work.	78.5	20.0	1.5

	Items	Agree	Neutral	Disagree
12	Online professional development program enables me to be confident in performing my teaching.	70.8	27.7	1.5
13	With online professional development programs, I am able to collaborate with others to improve my teaching.	75.4	20.0	4.6

Of the 13 items in Table 6.12, only one item has 58.5% of teachers who agree, while the others have more than 60%. This implies that this construct is a good predictor of use behaviour of online professional development programmes. The highest result for agreement is 81.5% (the more teachers perceive that OPD programmes have improved their work, they will be more likely to use them) whereas that of disagreement is 17% (experienced teachers do not use ICT in their classrooms).

Table 6.13: Teachers' experiences with teacher-training courses

	Items	Agree	Neutral	Disagree
1	Professional development courses are too theoretical.	60	30.8	9.2
2	The content of professional development courses changes the teaching practices of teachers.	58.5	35.4	6.1
3	The content of professional development courses is not related to the school context.	56.9	35.4	7.7
4	The content of professional development courses does not meet teachers' needs.	58.8	29.2	20
5	The professional development activities help me to grow professionally.	89.2	9.3	1.5
6	Professional development of teachers should focus on "how to teach" that is the practical aspect.	75.4	21.5	3.1
7	Teachers need to perceive the usefulness of teacher-training courses to benefit from them.	80	15.4	4.6
8	Teachers acquire PCK after following online teacher-training courses.	70.8	24.6	4.6
9	Short courses are more effective for teachers.	69.2	21.5	9.3
10	Intensive and lengthy professional development courses have more impact on teaching practices.	46.2	33.8	20
11	One-size-fit-all teacher-training courses are not adequate for the school advancement.	69.2	27.7	3.1

	Items	Agree	Neutral	Disagree
12	One-size-fit-all teacher-training courses does not meet teacher's needs.	73.8	20	6.2
13	Teachers prefer to invest their time in private tuitions or other activities rather than attending professional development courses.	63.1	27.7	9.2
14	The way I teach is influenced by my experiences since I was student.	61.5	29.2	9.2
15	If the course or program is not complex, teachers will more apt to use it.	78.5	18.5	3
16	My experiences as student influence the way I teach.	69.2	20	10.8
17	Online learning caters for all learning styles.	53.8	32.3	13.9
18	I can express myself freely in online professional development courses.	60	36.9	3.1
19	Online learning has removed the factor of time and space.	63.1	33.8	3.1

In Table 6.13 most of the items have more than 50% of teachers who agree except item number 10 which gets 46.2% of teachers who agree. This means that teachers believe that their experiences with teacher-training courses is an important factor. The “professional development activities help me to grow professionally” is the item with the highest rate of agreement (89.2%) and the “content of professional development courses does not meet teachers’ needs” is the one with the highest rate of disagreement (20%).

Table 6.14: Social factors

	Items	Agree	Neutral	Disagree
1	People in the school who use online professional development have more prestige than those who do not.	33.8	41.5	24.7
2	The school management encourages me to participate in online professional development programs.	40.0	33.8	26.2
3	In online learning environment it is more about digital presence rather than human contact.	64.6	29.2	6.2
4	Teachers tend to work in isolation.	60.0	29.2	10.8

5	I use the online professional development because of the proportion of teachers who use the system.	27.7	50.8	21.5
6	Teachers have difficulties to collaborate with colleagues within the school and in other schools.	41.5	43.1	15.4
7	People in the teaching field who online professional development have a high profile.	36.9	35.4	27.7
8	Using online professional development programs is a status in the school.	35.4	33.8	30.8
9	People who are important to me think I should use online professional development programs.	36.9	41.5	21.6
10	I can share experiences and resources with teachers within the school and with teachers in other schools with online professional development.	67.7	29.2	3.1

In Table 6.14, only three of 10 items have percentages higher than 50% of teachers who agree. This implies that teachers believe that this construct is not so important to predict their intention and use behaviour of online professional development. “I can share experiences and resources with teachers within the school and with teachers in other schools with OPD” got 67.7%, the highest rate of agreement. Six items had disagreement rates greater than 20% and using OPD is a status at school had the highest rate (30.8%).

6.4.1 Teachers’ experiences with teacher-training programmes

6.4.1.1 Theory versus practice

The median was calculated, and the value is 2, which meant that most of the respondents (72.3%) agreed that professional development courses were theory oriented rather than practice oriented. Only 1.5% of the respondents disagreed (see Appendix Q).

Table 6.13 shows the features of professional development from the teachers’ perspectives, with 27.7% strongly agreeing that professional development activities help teachers to grow professionally, and 61.5 agreeing with this statement. Therefore, to sustain their views, the participants emphasised the point that teachers acquired PCK after following

online teacher-training sessions as shown in Table 6.13, 18.5% strongly agree that teachers acquire pedagogical knowledge in online courses and 52.3% agree with this. Moreover, the findings show that teachers proposed that professional development programmes should focus on how to teach as 20% of the respondents strongly agreed and 55.4% agree with such view. This seems to indicate that teachers perceive online professional development as a means to acquire PCK, which will help them to teach better. Therefore, professional development providers must think about providing online professional development which focuses on how to teach using real-life video about teaching in different contexts. Teachers can pick up what they feel are relevant to their needs and adapt these concepts to their schools' context.

The findings in Table 6.13 also show some contradictions, as 13.8% and 46.5% of the participants strongly agreed and agreed respectively with the statement that professional development courses are too theoretical. At the same time, 20% strongly agreed and 38.5% agreed (58.5% in all) that the content of professional development courses changes their teaching practices. On the other hand, 56.9% (16.9% strongly agreed and 40% agreed) of the participants agreed the professional development course content does not reflect the school context. Furthermore, 50.7% (16.9% strongly agreed and 33.8% agreed) agreed the content does not meet teachers' needs. Therefore, the delivery mode of professional development must be changed to meet teachers' needs and schools' needs. There is a contradiction in their views, since they agree that the content is too theoretical and not related to their school's context, thus not meeting their needs and at the same they also agreed that PD content changes their practices. Their belief seems to be somewhat contradictory and confusing.

6.4.1.2 One-size-fits all

The respondents agreed (66.1%) that courses delivered in one-size-fits all mode do not meet their needs as they have individual needs. The result also revealed that 30.8% of the respondents were neutral regarding the statement (see Appendix Q). In Table 6.13, 44.6% of the respondents agreed that one-size-fits-all PD programmes do not meet teachers' needs, while 29.2% strongly agreed that this type of programme does not meet their needs. Therefore, a total of 73.8% agreed with this statement and 20% were neutral. Thus, more

specific programmes will be more appropriate for teachers to grow professionally. One-size-fits-all teacher-training courses do not contribute to school advance as highlighted by the results in Table 6.13, where 69.2% of the respondents agree that they are not adequate for school advancement.

Table 6.11 shows that 67.7% (24.6% strongly agreed and 43.1% agreed) of the teachers agreed that imposing one-size-fits-all professional development programmes leads to frustration and discontent. Only 27.7% were neutral and 4.6% disagreed with this statement. As the content is not relevant their respective schools' context, teachers become frustrated. Thus, this model of professional development programmes, because teachers are frustrated, will not benefit teachers' professional development. It indicates that teachers are losing their time and energy in addition to money. Therefore, alternative models need to be implemented for teachers to benefit from professional development and 81.5% of the respondents agree that online courses can be another way of providing professional development courses for teachers as shown in Table 6.9.

6.4.1.3 Course duration

Table 6.13 indicates how the respondents rated the two statements regarding course duration with respect to effectiveness. The first statement was that short courses are more effective for teachers and the second that intensive and lengthy professional development courses have more impact on teaching practices. The results showed some contradictions as 69.2% of the teachers agreed that short courses are more effective and only 9.2% disagreed; while 46.2% of the teachers from the sample tended to agree with the statement that intensive and lengthy professional development courses have more impact on teaching practices. In Table 6.13, 20% of the respondents disagreed with this statement. This indicates that the duration of the course must be adequate in terms of duration that is neither too short nor too long but related to teachers' needs.

6.4.1.4 Professional growth and progress

The median of the statements was calculated, the result being 2, which shows that 75.3% of the respondents agree that teachers needed to be up-to-date with advances in the educational field for them to grow and progress in their careers. Only 3.1% disagreed with

the statement (see Appendix Q). To teach well throughout their career, teachers need professional development and teachers' education programmes to improve and assist them in achieving the goals, before starting to teach, and throughout their career. In this study, 90.8% agreed that aspirant secondary school teachers should go for an initial teacher training. Table 6.8 shows that 6.2% were neutral and only 3% disagreed with the statement. While Table 6.8 also shows that 90.8% agreed that all teachers must have an initial teacher training and only 3.1% disagreed. Thus, teachers emphasised the importance of professional development through their career. Those who hold a first degree can join the teaching profession without any initial teacher training. But those who hold a Higher School Certificate and aspire to be teachers must go for Diploma in education or Bachelor's degree in education. But even though they think that all aspirant teachers and in-service teachers must follow professional development courses, in Table 6.13, 69.2% of them agree that their experiences acquired during their student life influence the way they teach. Thus, if teachers teach differently now, we shall this change in the next generation.

6.4.1.5 Teacher professional development and students' learning outcome

In Table 6.9, 56.9% of the respondents agreed that the content of online professional development courses was directly related to their work. Furthermore, 60% of them agreed that the content of these programmes can be adapted to their schools' context. Since the content was related to their work and could be adapted to their context, 77% of the respondents agreed that the content had helped them to improve their teaching. As their teaching improved, so the student outcomes would also improve. The teachers saw online professional development as being effective compared to face-to-face professional development as only 13.9% of the respondent disagreed with all three statements. Therefore, professional development providers must think of delivering professional development courses online.

6.4.1.6 Social influences

Table 6.14 shows that 26.2% of these teachers also claimed that they were not encouraged by the school management to enrol in online professional development programmes. Only 40% of the teachers agreed that the school management encourages them

to use online professional development course. Additionally, only 36.9% of them acknowledged that people who are important to them encouraged them to use OPD. Only 33.9% of the teachers agreed that people using OPD have more prestige than those who do not while 41.5% were neutral. Furthermore, only 36.9% of them agreed that people in the teaching field who use OPD have a high profile while 35.4% were neutral and 27.7% disagreed with this statement. Similarly, only 25.4% of them agreed that using OPD programmes gave status in the school while 33.8% were neutral and 30.8% disagreed. In the same way, only 27.7% agreed that they used OPD, while 50.8% were neutral and 21.5% disagreed. Teachers fear being judged by their peers as they are working in a system which favours competition. So they tend to work in isolation. But using online professional development, teachers can participate in forum discussion anonymously; therefore they can discuss freely without fear of being judged. As everyone is working and learning individually, social influences do not have an effect on their intention to use online professional development. But 67.7% still believe that they can share experiences and resources with the peers within the school and with teachers in another schools with online professional development. Only 3.1% disagreed with the statement. On the other hand, only 38.5% believed that school management valued teacher online professional development programmes and 44.6% were neutral as shown in Table 6.10. To conclude, it seems that social influences are not a significant contributor that positively influences teachers' experiences with teacher-training programmes.

6.4.1.7 School context

When there is no support and collaboration at the school level, teachers tend to be frustrated and isolated. Teachers claimed that school management does not encourage them to participate in online professional development; this may explain why teachers tend to work in isolation. So school management must provide time for teachers to meet regularly and also provide job-embedded ongoing professional development. By providing adequate infrastructure for teachers to participate in OPD at school is a way of encouraging them. In Table 6.11, 73.9% of the teachers agreed that limited ICT infrastructure is seen as an inhibiting factor to participating in OPD. But in Table 6.10 only 38.4% agreed that schools provided facilities for them to access OPD, and the same percentage agreed that school

managements value OPD programmes. Therefore, fewer teachers will tend to participate in such programmes. Furthermore, 41.5% of the teachers agreed that time is being provided to access OPD at their workplace. Therefore, we must make time provision in their workload to enable teachers to take part in online professional development programmes. Findings from this study indicate that OPD can provide just-in-time assistant to teachers at their workplace and the content can be adapted to their context.

6.4.2 Online teacher-training use behaviour

6.4.2.1 Teachers' conceptions about online learning

Table 6.12 shows that 58.4% (16.9 strongly agreed and 41.5 agreed) of the respondents agreed that experienced teachers (teachers with more than five years of experience) are not using ICT tools in their classrooms. Some teachers preferred to remain neutral regarding this item; this accounts for 24.6% of the respondents, while at the same time 76.9% of the teachers agreed that online professional development programmes help in improving their teaching and only 3.1% disagreed (Table 6.9). As teachers are not using ICT in their classes, they cannot access content that is readily available at their workplace. To encourage the usage of ICT in their classroom, teachers need to have access to adequate infrastructure at home as well as at school. It also indicates that it may be difficult for practicing teachers to alter their way of teaching.

As presented in Table 6.12, 76.9% of the respondents agreed that their beliefs about online professional development programmes and its potential to facilitate their professional learning are more likely to influence teachers' decision to use online professional development facilities. It is worth noting that no-one disagreed with this statement. Among the 65 respondents, 23.1% neither agreed nor disagreed with the statement that online professional development facilitates professional learning. The results also show that 78.5% of the respondents felt that teachers need PD which is more related to their needs to improve their daily work. Only 1.5% disagreed with this statement. They also believed that the more teachers perceive that OPD programmes have improved their work, the more likely they would be to use it. This account for 81.5% of the respondents; only 3.1% disagreed. The respondents believed that OPD resources promote creativity and innovation as well as allowing teachers' networking. As shown in Table 6.12, 80% agreed with this claim. To

conclude, it seems obvious that teachers know that OPD provides opportunities for them to advance in their careers but still they are not using it.

6.4.2.2 Motivation

Online learners must be autonomous and interactive, self-motivated and self-disciplined, and the level of integrity must be high. Table 6.12 shows how the respondents rated these characteristics as regards online learners. Table 6.12 also shows that 80% of the teachers agreed (32.3% strongly agreed and 47.7% agreed) that for learners to benefit effectively from online professional development, they must have the above characteristics; otherwise it will be difficult for the learner to engage in online learning.

Table 6.15: Crosstabulation – internet unfamiliarity and age group

			What is your age group?			
			20-29	30-39	40-49	50+
The unfamiliarity with the internet convention (e.g how to download or upload a task) causes a refractive action towards online courses.	Strongly agree	Count	3	9	3	2
		% of Total	4.6%	13.8%	4.6%	3.1%
	Agree	Count	6	15	5	2
		% of Total	9.2%	23.1%	7.7%	3.1%
	Neutral	Count	2	9	0	1
		% of Total	3.1%	13.8%	0.0%	1.5%
	Disagree	Count	1	2	2	0
		% of Total	1.5%	3.1%	3.1%	0.0%
	Strongly disagree	Count	2	1	0	0
		% of Total	3.1%	1.5%	0.0%	0.0%

In Table 6.15, the respondents acknowledged that they would be more motivated to engage in online courses, if they were familiar with internet conventions. As 26.2% strongly agreed and 43.1% agreed that as they are unfamiliar with internet conventions, they are resistant towards online courses, so teacher-training courses must be integrated with ICT skills so that teachers become more familiar with internet conventions. Moreover, 36.9% of those who agreed (13.8% strongly agreed and 23.1% agreed) were in the age group of 30 to

39 years old. The respondents who strongly disagreed were between 20 to 39 years old (4.6%) and those who disagreed were between 20 to 49 years old (7.7%).

Table 6.16: Crosstabulation – teaching experiences and private tutoring as a barrier

			Online professional development does not act as a barrier for teachers to offer private tuitions.				
			Strongly agree	Agree	Neutral	Strongly disagree	
For how long have you been teaching?	0-5	Count	4	7	7	1	
		% of Total	6.2%	10.8%	10.8%	1.5%	
	6-10	Count	5	2	5	1	
		% of Total	7.7%	3.1%	7.7%	1.5%	
	11-15	Count	8	7	7	0	
		% of Total	12.3%	10.8%	10.8%	0.0%	
	16-20	Count	1	1	0	0	
		% of Total	1.5%	1.5%	0.0%	%	
	20+	Count	3	4	2	0	
		% of Total	4.6%	6.2%	3.1%	0.0%	
	Total		Count	21	21	21	2
			% of Total	32.3%	32.3%	32.3%	3.1%

Table 6.16 shows that 32.3% strongly agreed and 32.3% agreed that online professional development is not a barrier for teachers to offer private tutoring and that teachers who did so could engage in professional development programmes. While looking closely at Table 6.16, we see that 50.9% of the respondents who agreed have teaching experience of between 0 to 15 years. Moreover, 10.8% have teaching experience of more than 20 years. On the other hand, 29.3% of the respondents who have teaching experience between 0 and 15 years were neutral. Thus, teachers must have intrinsic motivation to engage in OPD.

6.4.2.3 Benefits of online teacher training

In Table 6.14 67.7% of the teachers who completed in the questionnaire agreed that they could share their practices and resources with their peers within and outside the school with online professional development and is one of the benefits of online teacher training. As they can collaborate, the resources can be readily available to them. Only 3.1% of the respondents disagreed with the declaration. Therefore, teachers believed that they could benefit from online teacher training.

In Table 6.9, 60% of the teachers agreed and only 6.2% disagreed that the content of online professional development could be adapted to their school context, while 33.8% of the respondents were neutral. Therefore, teachers needed to have access to online professional development to further their learning. They also agreed (77%) that the content and activities of OPD helped them to improve their teaching and only 3.1% disagreed. On the other hand, 20% were neutral to this statement. Table 6.9 also shows that 56.9% the content of OPD is directly related to their work, while only 4.6% disagreed. But only 32.4% of the teachers agreed that the content and activities were readily available at their workplace, while 36.9% disagreed.

In Table 6.9, 58.5% of the respondents agreed that the content of OPD is continuously updated while only 6.2% disagreed. Moreover, Table 6.9 shows that 63% of the teachers agreed that the content of OPD can be used again and again; 4.6% disagreed. Thus, teachers can get access to updated resources, moreover, they can review these resources any number of times. The resources are always available.

In online professional development courses, teachers have the possibility to reflect on their own practices. In Table 6.9, 73.8% of the respondents agreed that they learnt more through reflection and discussion about their own practices. On the other hand, 7.7% disagreed. Thus, professional development programmes must provide opportunities for teachers to reflect on and discuss their own practices.

Table 6.13 shows that 60% of the respondents agreed that being able to express freely in online professional development courses is a benefit of OPD. It also showed that only 3.1% disagreed with such statement. This may imply that teachers would prefer OPD where they could express themselves freely. The result tends to show that teachers want to express their views while engaging in professional development.

6.4.2.4 Facilitating conditions

Table 6.17: Cross tabulation of gender and technical support provided for OPD

		Technical support should be provided if I am engaging in an online professional development program.					Total
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
Gender	Male	11	8	9	5	2	35
	Female	14	13	3	0	0	30

Females are more likely to believe that they will need technical support if they are to engage in online professional development course even though they may be digitally competent. As shown in the Table 6.17, 27 out of 30 females agree (14 strongly agree and 13 agree) that they will need technical support. Zero females disagree with the fact that they will need technical support to engage in OPD. But from Table 6.7, some of these females are part of the 44 participants who access the internet at least two times daily. But still, most of them requested for technical support if they are to engage in an online professional development course. This may result from a lack of confidence in their technical skills. Furthermore, they might tend to believe that technology is for men as these areas were male dominated. Another reason could be the subject choice at school level which could have been an influencing factor, where few girls chose technological subjects previously as compared to now.

In Table 6.9, 67.7% of the respondents agreed that the tasks in online professional development courses can be tackled by teachers of all ages, while only 4.6% of the teachers disagreed with such statement. Therefore, OPD courses must be available to teachers so that they can have opportunities to extend their learning. They believe that if online PD was available to them, they would be able to accomplish the tasks.

Table 6.10 shows that 63.1% of the teachers agreed that they could access resources at their ease anywhere using OPD, but 18.5% of them disagreed with such statement. It also shows that 60% of the teachers agreed that they could access resources when they needed to. On the other hand, 20% of the teachers disagreed with the point that they could access resources when needed in OPD. In Table 6.10, 63.1% of the teachers agreed that using OPD,

they could access resources related to their needs. It also shows that 13.8% of them disagreed with the statement that teachers could access resources related to their needs using OPD.

Table 6.9 shows that 49.2% teachers could get access to their peers' experiences using online professional development programmes. But 16.9% of the respondents disagreed that they could access others' experiences using OPD. Table 6.9 also shows that 66.1% of the respondents agreed that they could get access to foreign experiences locally through online professional development programmes without having to travel abroad. But 12.3% of them disagreed with this statement.

In Table 6.10, only 41.5% of the teachers agreed that time was being provided for them to access professional development at their workplace, whereas 33.9% disagreed with this statement. School management should make an effort to provide time for such activities. Thus, teachers would be encouraged to engage in professional development at their workplace. As a result, the whole school would benefit.

Table 6.10 also indicates that 69.2% of the respondents agreed that the ease of accomplishing basic tasks for the first time would encourage teachers to use online professional programmes. It also shows that only 3.1% of them disagreed with such statement. This tends to show that the teachers would use OPD if they felt confident in completing the tasks when they accessed OPD for the first time.

Moreover, Table 6.10 shows that 49.2% of the respondents agreed that specialised instructions were available while using online professional development. It also shows that 16.9% of the respondents disagreed that specialised instructions were available to them in online learning environment. The result shows that 33.8% were neutral towards the statement. This tends to imply that teachers believed that specialised instructions should be present in online professional development programmes to help all them.

In Table 6.10, 47.7% of the respondents agreed that they have the required resources to use online professional development programmes both at school and at home. But on the other hand, 26.1% disagreed and 26.2% were neutral as regards this statement. The results may imply that teachers need online professional programmes both at home and school. Thus, teachers need to have access to online resources as and when required, therefore the government needs to provide instant internet access.

6.4.3 Challenges of online teacher training

6.4.3.1 Implementation

Table 6.8 shows that 73.8% of the respondents agreed with the statement that educational reforms should focus on teachers' professional development. It also shows that 20% were neutral, while 6.2% of the respondents disagreed with this statement. So every educational reform must focus on teachers' professional development and not only on educational structure. Moreover, 66.2% of the respondents believed that professional development should be compulsory during teachers' careers and only 9.2% disagreed. Additionally, 75.4% of them agreed that PD should be compulsory, but accompanied with a salary increase. They also believe that PD should be embedded in their daily practices (76.9%). Therefore, the ICT infrastructure needs to be provided as 92.3% agreed that the schools must provide opportunities for TPD such as time for collaborating among teachers. They believe the mode of assessment needed to be changed to encourage creativity and innovation among teachers (86.2% agreed and 1.5% disagreed). Most of the respondents agreed that the trainers must be trained (93.8% agree). However, only 56.9% agree that there should be a Teacher Educational Council to regulate teachers' PD and 9.3% disagreed. Teachers believed that OPD must be implemented in such a way as to promote collaboration between peers. They think that there should be a body that regulated PD which should be recognised.

6.4.3.2 Formal and informal learning

The findings from Table 6.11 show that 78.5% agreed that informal learning should be recognised as a means of life-long learning. Only 4.6% disagreed with the statement. Teachers' beliefs about informal learning strongly influence their intention to engage in online professional development, which is freely available. Therefore, teachers' professional development providers and stakeholders should find ways to recognise teachers' informal learning. As there many open sources where teachers can get access to these informal learning resources. Table 6.11 also reveals that 69.2% of the participants believed that more learning takes place through informal learning rather than through formal learning. Only 4.6% disagreed with this statement. Informal online professional development must be recognised for teachers to use it; therefore, it should be well-structured.

6.4.3.3 Course structure

Table 6.10 shows that 87.7% of the teachers participating in the survey agreed that the course must be well-structured for teachers to participate in OPD programmes while only 1.5% disagreed. The results show that 53.9% of respondents agreed that support is available in online professional development when they encounter difficulties. Only 15.4% of respondents disagreed that support is being provided to them in online professional development programmes. So they believed that if online professional development programmes are well-structured and user friendly with support to help them when they encounter problems, it will encourage more teachers to engage in such programmes.

6.4.3.4 Unfamiliar

In Table 6.11, 55.4% of the teachers agreed that as they were familiar with a face-to-face learning system, it would be difficult to move to an online learning system, whereas 21.6% disagreed with this statement. It also shows that 69.3% of the respondents agreed that as teachers are unfamiliar with internet conventions, this caused a refractive action towards online courses. Only 12.3% disagreed that they were unfamiliar with internet conventions. So instructions in online teacher training need to be user friendly where teachers had just to click on an icon to access the resources. Therefore, stakeholders and providers of professional development should find ways to encourage and help teachers to move from the old PD system to online PD system.

6.4.3.5 Human contact

In Table 6.11, 55.4% agreed that as teachers are used to the old face-to-face learning system, it will not be easy for them to move to the new online learning system. But 21.6% of them disagreed with this statement. In Table 6.14, it is shown that 64.6% of the respondents recognise that now, in a digital world, it is more about digital presence rather than human contact and only 6.1% of the teachers disagreed with this statement. Teachers feel that they have to move to online learning and the same time they feel that this move is difficult. Moreover, this imply that they believe that human contact is not so important in this digital society.

6.4.3.6 Health problems

Table 6.11 shows that 69.2% of the teachers agreed that people could have health problems when using ICT devices for a long period of time. Only 9.3% disagreed with this statement. Teachers are conscious about the health problem related ICT usage. Therefore, this can be an important barrier for using ICT devices.

6.4.3.7 Self-discipline

When looking at Table 6.11, we can see that 70.8% of the teachers participating in the survey agreed that teachers need self-discipline to be able to participate in online professional development programmes and 26.2% were neutral, while only 3% disagreed. This characteristic has to be developed by the teachers so that they are not discouraged while learning on their own online, since no one will be there to remind or encourage them individually to complete a course. In online learning they can get a message to remind them about the deadlines but there will be no such pressure as in face-to-face. This situation can lead to isolation, where the teachers learn by themselves in their comfort zone. In Table 6.9, the results show that they can access others work in OPD on their own (49.2%). The respondents believed that self-discipline was an important factor while engaging in OPD. Thus, they would not have the tendency to cheat.

6.4.3.8 Authenticity of students' work

In Table 6.11, 83.1% of the respondents agreed that privacy and security must be provided to increase teachers' trust in online professional development programmes while only 1.5% disagreed. It also shows that 64.7% of the teachers related their lack of trust in online professional development to plagiarism and 7.7% disagreed. Therefore, online providers of professional development for teachers must provide privacy, security and cater for plagiarism problems to encourage teachers to enrol in online courses.

6.4.3.9 Curriculum constraint

From Table 6.11, it can be seen that 75.4% of the studied sample agreed that the curriculum of teacher PD programme should be adjusted according to teachers' range of beliefs and behaviour. Only 1.5% strongly disagreed with this statement. Table 6.10 shows

that 73.9% of the teachers agreed that professional development programmes must be more demand driven, that is, more specific courses are needed for teachers, and 3.1% disagreed. The teachers believed that professional development curriculum must be related to their beliefs and behaviour and be demand-driven.

The median for each construct has also been computed, and the results show that the respondents agreed that nine of the 10 constructs were factors influencing their usage behaviour of online professional development. Their modes and medians were 2. These constructs were performance expectancy, effort expectancy, facilitating conditions, OPD content and activities, evidence of students' performance, challenges of OPD, teacher's experiences with OPD, knowledge and beliefs, behavioural intention to use OPD and online teacher-training usage. The percentage who agreed was greater or equal to 60. On the other hand, for social influence, the mode and median were 3. This means that most of the respondents (56.9%) were neutral regarding social influence being a contributor to their beliefs about teacher online professional development (see Appendix R).

Further analysis determines to what extent social influence, facilitating conditions, performance expectancy, effort expectancy and behavioural intention predict or influence the usage behaviour of OPD courses. Previous studies (Shaper & Pervan, 2007; Venkatesh et al., 2003) have shown that these constructs account for almost 70% of the dependent variable in predicting behavioural intention to adopt or use a technology or system. A hierarchical multiple linear regression was chosen to answer this question as in such analysis the researcher would be able to see which variable added significant change in predicting user's use behaviour of online teacher-training programmes. Moreover, it allowed the researcher to enter the variables in steps. The researcher entered the variable related to UTAUT model first followed by those of teacher learning model. The next section presents the multiple regression analysis.

6.5 Multiple linear regression

As claimed by Field (2009), "regression analysis enables us to predict future (outcomes) based on values of predictive variables" (p. 198). The researcher used a parametric inferential statistics approach for analysing the collected data in the quantitative approach of this study. The resulting model would be used to draw inferences or make

predictions regarding secondary school teachers' behavioural intention to use online teacher-training programmes and their beliefs about online professional development. A hierarchical multiple linear regression method of analysis was used to measure the strength of the link between each of a set of explanatory variables (independent variables) and a single response (or dependent) variable (Landau & Everitt; 2004). This method was used to understand to what extent the variables or constructs are predictors of teachers' intention to use online professional development and teachers' usage of such a system. Furthermore, multiple regression was used to assess if the facilitating and inhibiting factors could be used to predict teacher beliefs about OPD. It also assessed the relationship among the set of variables. As it may be the first time that UTAUT model has been used in the Mauritian context of online professional development for teachers, it is imperative to reconsider its factors and the interactions among them. Furthermore, having combined two models (teacher learning and the UTAUT model) in this study, and that the constructs (PE, EE, SI and FC) from UTAUT have already been proven to impact on the intention and usage of technology, it was necessary to explore which set of variables was able to predict teachers' intention and usage of OPD other than the four found in UTAUT.

The variables were evaluated to determine their impact on the dependent variable. In this study, the researcher used multiple regression to show how the predictor variables influenced the dependent variables such as BI to use the online learning and also the teachers' usage behaviour.

The assumptions that must be met for the hierarchical multiple linear regression to be valid are: 1) the random independent variables must be normally distributed and linearly related to dependent variable; 2) the independent variables must be free of error; 3) the variance of the dependent variable as a function of the independent variables must be constant, which is referred to as homoscedasticity; and 4) the independent variables must be relatively uncorrelated. Before the hierarchical multiple regression analysis was conducted, preliminary analyses were performed to ensure there was no violation of assumptions of normality, linearity and multicollinearity. The variance inflation factor (VIF) and tolerance values were calculated to find out whether there was multicollinearity between the variables. Any VIF of 10 or above and tolerance values of .10 or less (equivalent to a VIF of 10) showed serious problems of multicollinearity regarding independent variables (Cohen et al., 2003;

pp. 423–424). Both the VIF and the tolerance value was 1.00 for Behavioural intention to use OPD. The VIF values varied from 1.68 to 3.67, and the tolerance values ranged from .27 to .60 when the four independent variables FC, PE, EE and SF were added. The Pearson correlation varied from .52 to .86 (see Appendix T). While adding the five other variables (teachers' experience, challenges of online teacher training, knowledge and beliefs, content and activities and evidence of students' performance) to the existing five, the VIF values varied from 1.43 to 4.76, the tolerance values ranged from .21 to .70 (see Appendix S) and the Pearson correlation ranged from .50 to .86 as shown in Appendix T. "The level of multicollinearity can be assessed by looking at the predictor variables. The predictor variables should not have a strong relationship with each other; the stronger the relationship between the predictors, the higher the degree off multicollinearity of the betas" (Walker, 2011, p. 7). The levels of tolerance are not beneath .1 and the VIF scores are below 10, the comparative starting point levels that highlight concern with the data. Therefore, the predictive variables do not excessively influence each other. Based on these results, the researcher decided to conduct multiple regression. According to Krawthol and Anderson (2001), the significance level was set at $p < .05$, being the normal level used while working on significance. The researcher looked at the unstandardised coefficient beta weights and the standardised beta weights of each predictive variable to be able to check the significance and the importance of each predictive variable. Furthermore, the R squared was used to assess the interactions among the numerous predictive variables and the dependent variable. The predictive variables are: behavioural intention to use OPD, facilitating conditions, effort expectancy, performance expectancy, social factors, teachers' experiences, challenges of online teacher training, knowledge and beliefs, content and activities and evidence of students' performance. The dependent outcome variable is online teacher-training use behaviour.

The calculated Pearson Correlations values among the 10 predictive variables are shown in Appendix T. None of the correlations attained the 1.0, so the analysis indicates that no two variables are strongly related. Summary models were created during the hierarchical multiple regression analysis.

Table 6.18: Model Summary of Hierarchical Multiple Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.79 ^a	.63	.62	7.20	.63	105.61	1	63	.000
2	.79 ^b	.63	.62	7.23	.00	.47	1	62	.495
3	.86 ^c	.74	.72	6.14	.11	24.84	1	61	.000
4	.87 ^d	.76	.75	5.89	.03	6.34	1	60	.014
5	.92 ^e	.84	.83	4.81	.08	31.17	1	59	.000
6	.92 ^f	.85	.83	4.79	.00	1.21	1	58	.260
7	.92 ^g	.81	.83	4.78	.00	1.30	1	57	.259
8	.96 ^h	.93	.92	3.37	.08	58.56	1	56	.000
9	.96 ⁱ	.93	.92	3.39	.00	.66	2	54	.523
a. Predictors: (Constant), Behavioural intention to use OPD									
b. Predictors: (Constant), Behavioural intention to use OPD, Social factors									
c. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy									
d. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy, Facilitating conditions									
e. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy, Facilitating conditions, Performance expectancy									
f. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy, Facilitating conditions, Performance expectancy, knowledge and beliefs1									
g. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy, Facilitating conditions, Performance expectancy, knowledge and beliefs1, Evidence of student performance									
h. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy, Facilitating conditions, Performance expectancy, knowledge and beliefs1, Evidence of student performance, Content and activities									
i. Predictors: (Constant), Behavioural intention to use OPD, Social factors, Effort expectancy, Facilitating conditions, Performance expectancy, knowledge and beliefs1, Evidence of student performance, Content and activities, challenges of OPD, Teachers' experiences									
j. Dependent Variable: Online teacher training usage									

Table 6.18 shows the result of the predictive variables. A nine-stage hierarchical multiple regression was carried out to study how the set of independent variables are related to the dependent variable. Behavioural intention to use OPD was the predictor of online

teacher-training usage in model 1. The R value was .79; thus, there is a high positive relationship between the predictor variable and online teacher-training usage. The R^2 (.63 or 63%) was greatly significant at $F(1, 63) = 105.61, p < 0.001$, since it could account for 63% of the variance. Consequently, behavioural intention to use OPD contributed significantly to online teacher-training usage.

Two predictors (behavioural intention to use OPD and social factors) were used in model 2, where there was no improvement over the previous model. The R value was .79 and an R^2 remained .63, thus accounted for 63% of the variance. The change in R^2 was not significant $F(1, 62), p > 0.05$. This showed that social factors could not predict online teacher-training usage.

With three predictors (behavioural intention to use OPD, social factors and effort expectancy) model 3 gave an improved value for $R = .86$, with an R^2 of .74, accounted for 74% of the variance. The change in R^2 was very significant $F(1, 61) = 24.84, p < 0.001$, and subsequently the result showed that a good predictor of online teacher-training usage was effort expectancy.

For model 4, there were four predictor variables (behavioural intention to use OPD, social factors, effort expectancy and facilitating conditions), the value of R has improved slightly to .87, with an R^2 of .76, and thus 76% of the variance had been accounted for. R^2 was significant $F(1, 60) = 6.34, p < 0.05$. Therefore, facilitating conditions was a predictor of online teacher-training usage.

The five-predictor variable (behavioural intention to use OPD, social factors, effort expectancy, facilitating conditions and performance expectancy) of model 5 showed an improvement of the R value from .87 to .92 with an R^2 of .84, explaining 84% of the variance. The R^2 change was very significant $F(1, 59) = 31.17, p < 0.001$. Therefore, these results showed that performance expectancy contributed significantly to online teacher-training usage.

For the model with the six predictor variables (behavioural intention to use OPD, social factors, performance expectancy, facilitating conditions, effort expectancy, knowledge and beliefs), the value of $R = .92$ and $R^2 = .85$, accounted for 85% of the variance, but the change in R^2 was not significant $F(1, 58), p > 0.05$.

In model 7, there were seven predictor variables (behavioural intention to use OPD, social factors, facilitating conditions, performance expectancy, knowledge and beliefs, effort expectancy and evidence of student performance); there was no improvement in the value of $R = .92$ as well as $R^2 = .85$, thus 85% of the variance has been reckoned for and the change in R^2 was not significant $F(1, 57), p > 0.05$ also. Hence, knowledge and beliefs and evidence of students' performance could not predict online teacher-training usage.

Model 8, with eight predictors (behavioural intention to use OPD, social factors, effort expectancy, facilitating conditions, performance expectancy, knowledge and beliefs, evidence of student performance, content and activities), the value of R has changed from $.92$ to $.96$ with $R^2 = .93$ which accounted for 93% of the variance. The R^2 change was very significant $F(1, 56) = 31.17, p < 0.001$. So, it was clear that content and activities contributed significantly to online teacher-training usage.

In model 9, there were 10 predictor variables (behavioural intention to use OPD, social factors, facilitating conditions, performance expectancy, knowledge and beliefs, effort expectancy, evidence of student performance, content and activities, challenges of OPD, teachers' experiences) with R value of $.96$ and $R^2 = .93$, accounted for 93% of the variance. The change in R^2 was not significant $F(1, 54), p > 0.05$. Therefore, challenges of OPD and teachers' experiences did not have any effect on online teacher-training usage.

The result of ANOVA in Table 6.19 provides us with the significance of each of the nine models. All the nine models were significant as all the p values were less than $.001$ ($p < .001$). Model 1 has the largest F value and it has only one predictor.

Table 6.19: ANOVA Results of the Nine-Model-Hierarchical Regression Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5473.15	1	5473.15	105.61	.000 ^b
	Residual	3265.09	63	51.83		
	Total	8738.25	64			
2	Regression	5497.75	2	2748.88	52.59	.000 ^c
	Residual	3240.49	62	52.27		
	Total	8738.25	64			
3	Regression	6435.59	3	2145.12	56.83	.000 ^d
	Residual	2302.66	61	37.75		

Model		Sum of Squares	df	Mean Square	F	Sig.
	Total	8738.246	64			
4	Regression	6655.75	4	1663.94	47.941	.000 ^e
	Residual	2082.50	60	34.71		
	Total	8738.25	64			
5	Regression	7375.62	5	1475.12	63.87	.000 ^f
	Residual	1362.63	59	23.10		
	Total	8738.25	64			
6	Regression	7405.30	6	1234.22	53.70	.000 ^g
	Residual	1332.95	58	22.98		
	Total	8738.25	64			
7	Regression	7435.02	7	1062.15	46.46	.000 ^h
	Residual	1303.23	57	22.86		
	Total	8738.25	64			
8	Regression	8101.20	8	1012.65	89.02	.000 ⁱ
	Residual	637.05	56	11.38		
	Total	8738.25	64			
9	Regression	8116.31	10	811.63	70.47	.000 ^j
	Residual	621.93	54	11.52		
	Total	8738.25	64			

The β coefficients (see Appendix S) for the constant and five predictors of online teacher-training usage were as followed: Constant $\beta = -2.83$, $t = -0.94$, $p = 0.35$: not significant; Behavioural intention to use OPD, $\beta = 0.14$, $t=1.94$, $p = .06$: not significant; Social factor, $\beta = -0.06$, $t = -1.13$, $p = .26$: not significant; Effort expectancy, $\beta = 0.22$, $t = 3.99$, $p < 0.001$: significant; Facilitating conditions, $\beta = 0.18$, $t = 2.73$, $p = .008$: significant; Performance expectancy, $\beta = 0.26$, $t = 3.60$, $p = .001$: significant; knowledge and beliefs, $\beta = 0.03$, $t = 0.66$, $p = .52$: not significant; evidence of students' performance, $\beta = -0.25$, $t = -3.99$, $p < 0.001$: significant; content and activities, $\beta = 0.56$, $t = 7.69$, $p < 0.001$: significant; Challenges of OPD, $\beta = 0.07$, $t = 1.12$, $p = .27$: not significant; Teachers' experiences, $\beta = -0.04$, $t = -0.49$, $p = .63$: not significant. The model: Online teacher-training usage = 0.22 (Effort expectancy) + 0.18 (Facilitating conditions) + 0.26 (Performance expectancy) – 0.25 (Evidence of students' performance) + 0.56 (Content and activities). Performance expectancy, Effort expectancy, facilitating conditions, Content and activities and Evidence

of student performance are coded as 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree.

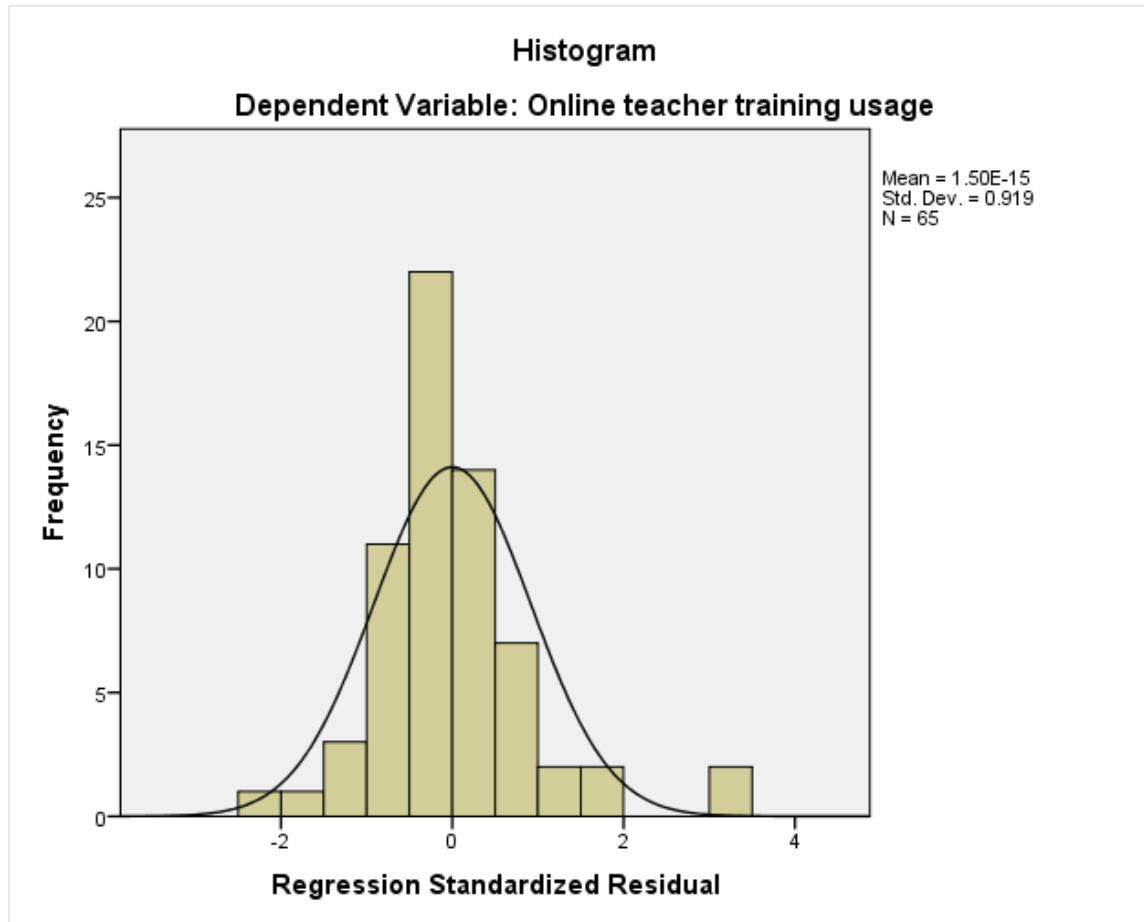


Figure 6.1: Histogram

Figure 6.1 indicates that a compact concentration of the predictive variables has an influence on online teacher-training use behaviour. The tallest bars on the graph have the greatest influence on online teacher-training use behaviour. They are: Performance expectancy ($p = .001$), Effort expectancy ($p = .000$), Facilitating conditions ($p = .008$), Content and activities ($p = .000$) and Evidence of students' performance ($.000$). The equal intervals along the abscissa (x-axis, predictors) imitate the numerous class intervals relative to student outcomes.

6.6 Behavioural intention to use OPD

A seven-stage hierarchical multiple regression was carried out to evaluate the relationship among the set of independent variables (Performance expectancy, Social factors, Effort expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledge and beliefs, Content and activities, Evidence of student performance) and the dependent variable (behavioural intention to use OPD). Social factors, effort expectancy and performance expectancy were the predictor of behavioural intention to use OPD in model 1, the R value was .76 thus, and there was a high positive relationship between the predictor variables and Behavioural intention to use OPD. The R^2 (.58 or 58%) was highly significant at $F(3, 61) = 23.32, p < 0.001$, since it could account for 58% of the variance. Consequently, social factors, performance expectancy and effort expectancy contributed significantly to behavioural intention to use OPD. One predictor (facilitating conditions) was used in model 2, there was an improvement compared to the previous model. The R value was .85 and an R^2 remained .73, thus accounted for 73% of the variance. The change in R^2 was highly significant $F(1, 60) = 31.92, p < 0.001$. This indicated that facilitating conditions was a good predictor of behavioural intention to use OPD. With five predictors (social factors, performance expectancy, effort expectancy, facilitating conditions and challenges of OPD). Model 3 did not improve the value for $R = .85$, with an R^2 of .73, accounted for 73% of the variance. But the change in R^2 was not significant $F(1, 59), p > 0.05$, consequently the result showed that challenges of OPD was not a good predictor of behavioural intention to use OPD. For Model 4, there were six predictor variables (performance expectancy, social factors, effort expectancy, facilitating conditions, challenges of OPD and teachers' experiences), the value of R has improved slightly to .86, with an R^2 of .73, and thus 73% of the variance had been accounted for. R^2 was not significant $F(1, 58), p > 0.05$. Therefore, teachers' experiences were not a predictor of behavioural intention use of OPD. The seven predictor variables (performance expectancy, social factors, effort expectancy, facilitating conditions, challenges of OPD, teachers' experiences and knowledge and beliefs) of model 5 showed no improvement of the R value = .86 with an R^2 of .74, explained 74% of the variance. The change in R^2 was not significant $F(1, 57), p > 0.05$. Hence, these results showed that knowledge and beliefs could not predict behavioural intention to use OPD. For model 6 with the eight predictor variables (performance expectancy, social factors, effort

expectancy, facilitating conditions, challenges of OPD, teachers' experiences, knowledge and beliefs and content and activities), the value of $R = .86$ and $R^2 = .75$, accounted for 75% of the variance, but the change in R^2 was not significant $F(1, 56), p > 0.05$. In model 7, there were nine predictor variables (effort expectancy, performance expectancy, social factors, facilitating conditions, challenges of OPD, teachers' experiences, knowledge and beliefs content and activities and evidence of student performance), there was no improvement in the value of $R = .86$ as well as $R^2 = .75$, thus 75% of the variance has been accounted for and the change in R^2 was not significant $F(1, 55), p > 0.05$ also. Therefore, evidence of students' performance could not predict behavioural intention to use OPD (See Appendix L).

The result of ANOVA provided the significance of each of the nine models. All the nine models were significant as all the p values were less than .001 ($p < .001$). Model 2 has the largest F value and it has only one predictor (See Appendix M).

The β coefficients for the constant and the predictor of teachers behavioural intention to use online PD were as followed: Constant $\beta = 1.86, t = 0.69, p = 0.49$: not significant; Social factor, $\beta = 0.15, t = 1.49, p = 0.14$: not significant; Effort expectancy, $\beta = -0.08, t = -0.79, p = 0.44$: not significant; Facilitating conditions, $\beta = 0.44, t = 4.23, p < 0.001$: significant; Performance expectancy, $\beta = 0.22, t = 1.64, p = 0.11$: not significant; knowledge and beliefs, $\beta = 0.09, t = 1.12, p = 0.27$: not significant; Evidence of students' performance, $\beta = -0.09, t = -0.79, p = 0.43$: not significant; content and activities, $\beta = 0.16, t = 1.21, p = 0.23$: not significant; Challenges of OPD, $\beta = -0.04, t = -0.37, p = 0.71$: not significant; Teachers' experiences, $\beta = 0.16, t = 1.06, p = 0.29$: not significant. The model: Behavioural intention to use OPD = 0.44 (Facilitating conditions) (See Appendix N).

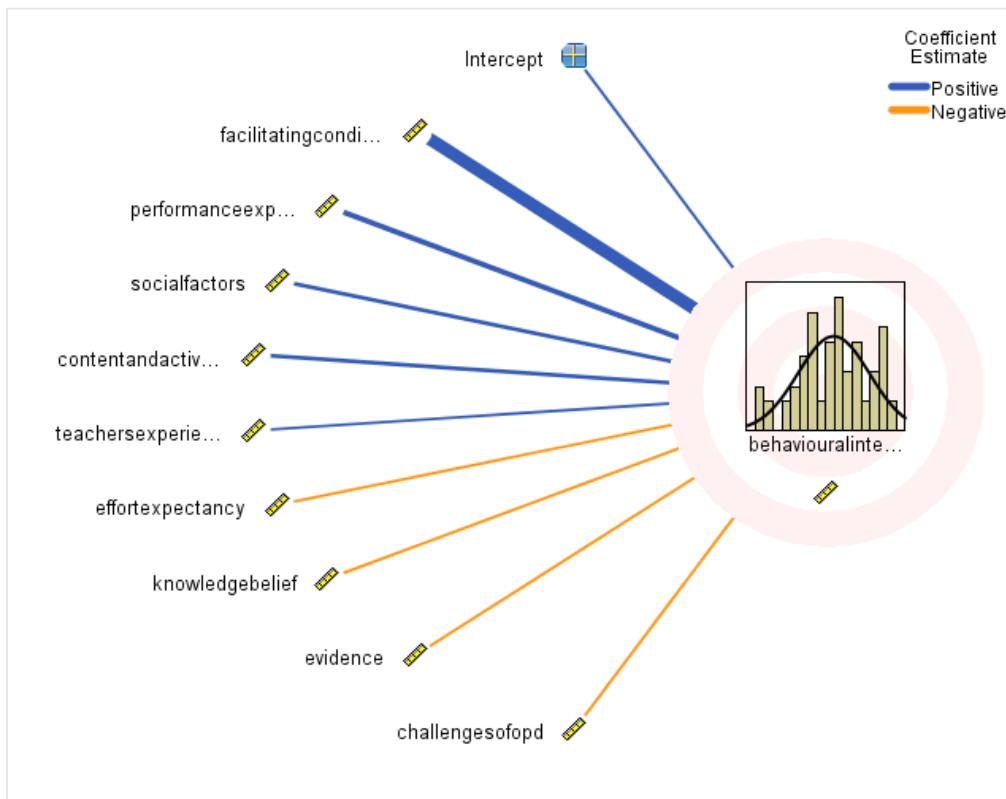


Figure 6.2: The coefficient estimate of the constructs related to behavioural intention to use OPD

The thickness of the line in Figure 6.2 represents the importance of the construct related to behavioural intention to use OPD. Facilitating conditions is the most important construct in predicting teachers' behavioural intention to use OPD, followed by performance expectancy. Social factors, content and activities of OPD and teachers' experiences with OPD have less positive importance in predicting teachers' behavioural intent to use OPD. whereas effort expectancy, knowledge and beliefs, evidence of student's performance and challenges of OPD have less negative influence in predicting teachers' behavioural intention to use OPD.

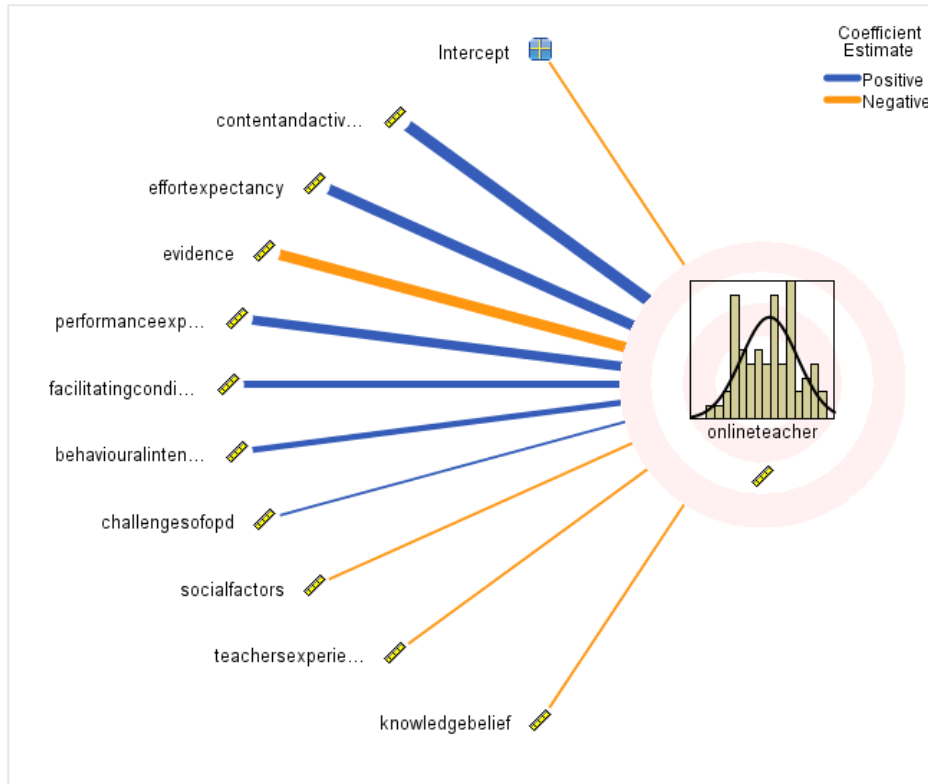


Figure 6.3: The coefficient estimate of the constructs related to online teacher-training use behaviour

Figure 6.3 shows how the different constructs are related to online teacher-training use behaviour. The thickness of the lines shows the construct's importance and the colour is how they influence online teacher-training use behaviour. The content and activities of OPD programmes have a greater importance and positively influences the usage of online teacher-training programmes followed by effort expectancy. Which seems less evidence is that evidence of students' performance has a significant negative impact on the usage of online teacher-training programmes. Behavioural intention to use OPD, challenges of OPD are less positively influenced online teacher-training usage. Whereas social factors, teachers' experiences with OPD and knowledge and beliefs are less important negatively in predicting online teacher-training usage.

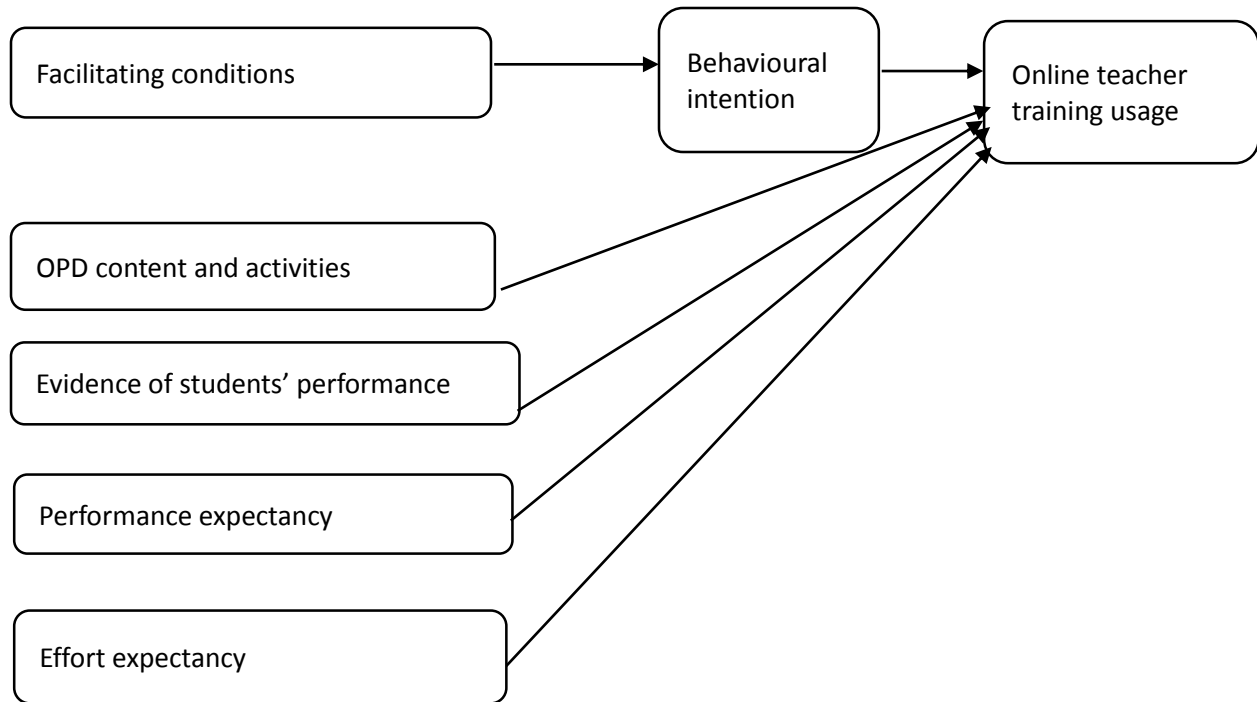


Figure 6.4: The multiple regression model (CF3)

The results of the multiple regression analysis were used to develop this model. Only five independent variables were statistically significant with online teacher-training usage. Content and activities were the most important predictive variables with beta weight of 0.56. This shows that for every unit increase in the usefulness of content and activities there is a 0.56 rise in the beta weight related to online teacher training use behaviour. Thus, the number of teachers engaging in online teacher training would increase if the content and activities are related to teachers' work. While content and activities, facilitating conditions, effort expectancy and performance expectancy positively influence online teacher-training usage, but evidence of students' performance has, unexpectedly, a negative impact on online teacher-training usage. This may be due to the fact that teachers consider that there is no need for engaging in online professional development programmes as students are already performing well. Moreover, facilitating conditions have a positive impact on the behavioural intention to use OPD compare to the UTAUT model proposed by Venkatesh et al. (2003) where facilitating conditions have direct influence on usage behaviour.

6.7 Chapter summary

This chapter explained how the quantitative data obtained in phase two were collected and analysed in this study. A summary of the respondents' backgrounds and demographic profiles were provided using descriptive statistics. The themes emerged from the qualitative approach was analysed with the quantitative data. Multiple regression analysis was conducted to determine how significant the predictors were. But multiple regression can analyse only one dependent variable at a time. A new model was obtained, in which facilitating conditions is a predictor of behavioural intention to make usage of online teacher training and OPD content and activities, evidence of student performance, effort expectancy, performance expectancy and behavioural intention were predictors of online teacher training usage. The model can predict online teacher-training usage up to 93%.

The results from Appendix R tend to show that the other constructs like challenges of OPD, teacher's experiences with OPD, knowledge and beliefs could have indirect effect on teachers' beliefs about online professional development. But after the multiple regression analysis, it was found that these three constructs did not significantly influence teachers' beliefs about online professional development. Findings from both the multiple regression and the computed median show that social influence was not a contributor to teachers' beliefs about online professional development. Moreover, course duration and human contact did not influence teachers' behavioural intention and usage of online professional development. As the emerging model proposed was too complex to determine the causalities, future research could be carried out with a larger sample size, using Structural Equation Modelling (SEM) to explore the links between the different constructs. Further research need to be done to validate the scale measuring teachers' beliefs about online professional development. Figure 6.4 shows the OPD model got from the multiple regression analysis giving rise to conceptual framework CF3. The most important findings are that OPD content and activities were the strongest predictors of online teacher-training usage and that social factors was no longer a strong predictor of behavioural intention to use OPD as well as online teacher training usage.

CHAPTER SEVEN: FINDINGS AND DISCUSSION

7.1 Introduction

This chapter takes us back to the critical questions introduced in Chapter one while paying attention to the scope within which these questions have been responded to, discussing the unanticipated results as well. The study set out to explore teacher's beliefs about online professional development in Mauritius, the facilitating and the inhibiting factors of online professional development, how these beliefs are constructed and why teachers have such beliefs. The study has also sought to understand whether teachers' beliefs can result in increasing teachers' engagement in online professional development effectively. The overall theoretical literature on this topic and, especially in the Mauritian context, is lacking on some important questions. The study has pursued to answer these four questions:

1. What are the secondary school teachers' beliefs about OPD and why do they have such beliefs?
2. What are the facilitating and inhibiting factors that influence secondary school teachers' beliefs about OPD?
3. How are secondary school teachers' beliefs about OPD constructed?
4. What model can be developed to explain the participation of secondary school teachers in OPD?

The analysing of the participants' understanding and the relationships between the variables constitute the important findings that resulted as categories and which are described in the two preceding chapters. The aforementioned chapters inferred that the analysis of the participants' understanding and the resulting categories in this study would be brought into perspective in this chapter. The overall findings based on the two previous chapters are summarised by the following main themes in relation to research questions: professional growth and progress, teachers' conceptions about online learning and the implementation of PD programmes. These themes have been reworked with some sub-themes discussed within the different main theme (category) as indicated in Table 5.1.

This chapter consists of six sections. **Section one** is an introduction to the chapter. **Section two** deals with the first category, professional growth and progress. **Sections three**

and **four** discuss teachers' conception of online learning and implementation of PD programmes respectively. These three sections answer the research questions one to four. **Section five** is a comparison of the three conceptual frameworks. **Section six** is a synthesis to the chapter.

7.2 Professional growth and progress

The key objective of professional development is to advance teachers' teaching practices, thereby improving students' performance as well as helping teachers to grow and progress in their careers. Unfortunately, this is not the case as teachers attend PD programmes which are too theoretical and offered in one-size-fits all mode; in addition because they have been told (as if forced) to do so by the school management. Therefore, this objective is not being met by the current form of PD offered. The reason teachers are not keen to engage in professional development programmes is their pedagogical beliefs which are important while taking pedagogical decisions. Their pedagogical beliefs influence their classroom practices. Moreover, the current face-to-face PD is offered in one-size-fits-all mode. Therefore, the curriculum is constrained as there are more theories than practical applications; hence it has no impact on students' performance. However, the participants indicated that they needed more practical sessions or applications. It would appear that such a course would be too long to fit the tight schedule of teachers. Added to this scenario is the fact that PD is not compulsory in the Mauritian education context. Anyone with a Bachelor degree is allowed to be a teacher. However, the importance of the need for PD is recognised for new teachers. The participants' views are in line with the literature regarding the significance of professional development. The experienced secondary school teachers have claimed the importance of aspirant teachers to go for a preliminary teacher training, meaning that teachers are conscious about the significance of professional development (pre-service and in-service training too). This is in line with literature which highlights the importance of pedagogical skills as well as content knowledge. Actually, those who have a first degree do not need pre-service nor in-service teacher training as this is not compulsory. But as the students' needs are changing, teachers need to update their skills through PD to cope with these changes. Thus, teachers need continuous PD to grow and progress professionally.

Professional development needs to be effective for it to be a source of motivation for teachers as the participants in the study contend.

The participants made it clear that they need PCK to improve their teaching, that is, how to teach in such a way that it is up-to-date. Unfortunately, methodology, that is, the planning, timing, procedure, assessment and remedial action, is rarely offered in textbooks. This confirms what was found in literature where professional development is usually referred to continuous learning possibilities offered to teachers and other individuals in the educational field (Vu, Cao, Vu, & Cepero, 2014). But even though teachers participating in the focus group have highlighted the importance for being lifelong learners, results from the survey indicate that teachers are not lifelong learners as shown in Table 6.4 in the previous chapter. Therefore, what teachers believe differ from their action in real life. The finding from the focus groups is in line with what Liu (2012) claims teachers should be nowadays, that is be lifelong learners as the learning standards are being redefined continuously (Liu, 2012), as is the case in the majority of high-achieving nations which embedded professional development in teachers' working time (Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). At this stage of understanding, we believe that teachers are conscious about the importance of professional development, but do not engage in such courses, even though these courses tend to enhance ongoing and sustainable learning for teachers. Certainly, in context like ours, it will be a plus for teachers if PD is embedded in teachers' working hours and related to their needs.

The in-service teacher training must be based on teachers' needs (Avalos, 2011; OECD, 2010), so that teachers can access needed facilities as stated by the participants. As indicated in literature (Joyce & Showers, 1980), for learning to be effective, it should include theory, demonstration, practice, classroom application and feedback. A similar conclusion was reached by Putnam and Borko (2000) who proposed a teacher learning environment which is more diverse for both existing and future teachers: working with instructional experts, ongoing workshops focusing on instruction, discourse communities among teachers, pairing university-based researchers or staff developers with current teachers; taking a children's literature course, participating in discourse communities through mentoring of for prospective teachers; and taking a case-based teaching course together for both current teachers and prospective teachers. It is the researcher's belief that just having access to

theories and strategies is not enough, as teachers can do this on their own. The training must include classroom demonstration, provide support in the daily teaching and feedback to the teachers.

Our educational system favours elitism; therefore, teachers focus more on results rather than the holistic development of the students. Professional development courses offered to teachers tend to follow the same trend, as the examination assesses mostly memorisation of theories. Teachers are learning the course's content to get the certificate rather than deepening their experiences. Professional development courses must be restructured towards more learning by doing experiences. We would continue to get the same result, if we continue to PD in the current form. An important question associated with such finding, is whether we will continue to deliver PD in this same way.

Theory versus practice: professional development must offer the possibilities for teachers to enhance their practices. So teachers must participate in professional development throughout their careers. The content of the PD programme must be related to teachers' needs so that they can adjust their teaching practices. Teachers in the study (from both phases) agree that professional development courses are too theoretical and that the content of these courses does not meet their needs. The teachers may have gone beyond the question and expressed their desire regarding professional development, which should be focusing on the art of teaching, which is the very heart of teacher-training programmes; just theories are not enough to improve teachers' practices. Teachers may be afraid of disparaging the professional development institution they attended and fear their peers' reaction regarding their competence and certificates after following such courses. On the other hand, teachers are doing their best to apply these theories in their context but there are many factors that must be taken into consideration as the participants in the focus group highlighted. These factors are the school context, the management of the school, teacher's individual needs, the stakeholders and students' needs, among others. At the end they feel that what they have learnt is obsolete. However, in line with the idea of Shulman (1986), it can be concluded that the content knowledge is not enough and need to be restructured. Therefore, we must move beyond teachers' craft knowledge to be able to unify theory and practice (Stones, 1989).

Therefore, professional development must be more effective and engaging today as the traditional approach in form of workshops or expert-delivered activities has proved to be

ineffective. Little (2006) suggests that professional development programmes must be content-focused, active, collective, coherent, and sustained to effectively help teachers to not only deliver content of the subject knowledge but acquire the PCK required for teaching the subject.

The role of teacher training should facilitate the linking process of theory and practice and provide space where teachers can learn by doing. The findings in the analysis coincide with the literature, where it was revealed that the courses are too theoretical and teachers find it difficult to implement these theories in their practices. In teacher training, transfer of theory is not enough, as it is not in line with reality and the complexity of action in practice (Cohen & Hill, 1998). After acquiring knowledge in teacher-training programmes, student teachers indicate that this knowledge does not help them to handle uncertainty, complexity and instability that arise in practical situations (Oosterheert, 2001). Therefore, teachers have the tendency to imitate their teachers when they were students since that is the way they have been taught as Korthagen and Kessels (1999) found in their study. So we must find an alternative way to deliver PD where theory and practice can be unified. As teachers need TPCK in the 21st century (Mishra & Koehler, 2006; Niess, 2005), blended learning can be another way to provide PD being a more successful pedagogy (Joosten, Barth, Harness & Weber, 2014) which can integrate both theories and practices in the teacher professional development curriculum.

One-size-fits-all: the participants agreed that professional development programmes offered in one-size-fits-all mode lead to frustration and discontent among teachers as the content of courses delivered in this mode does not meet teachers' needs and, therefore, does not contribute to advancement in the school. Teachers need just-in-time solutions to their problems, but as the courses cover general situations which may not be what these teachers needed at this given time. So teachers need tailor-made PD content. Another reason for this discontent and frustration is that teachers feel that general aspects of PD can be learnt through the internet or in books. Thus, PD will continue to be ineffective if we continue to deliver PD courses in this mode. Therefore, the mode of delivery needs to be changed to be effective. Contrary to the finding of Stones (1989) we did not find the importance of general application pedagogy. On the other hand, the participants in this study acknowledge that each individual is unique, so we need to provide spaces so that each learner can be developed

to his or her highest potential, as every individual is different, has different abilities, interests and needs; thus, teachers would be able to “educate each child in a way and at a pace which suits them” (DfES, 2001, p. 20). Since the current approach brings frustration and discontent, it is a loss of time and energy as the content is not related to their school’s context. Therefore, we must go beyond what is offered in the classroom now for professional development to be effective. So, to achieve such improvement, teachers must have access to pedagogy which will help them to be creative and innovative. Professional development institutions need to change the way of delivering such programmes to help improve teachers’ PCK. In fact, continuing to be in a system where teachers are being told what do without taking into account their experiences, in contrast to one where they can be active learners, will not give them the opportunity to share visions, advice and lessons with their peers. Thus, teachers must be capable of taking control over their professional development where they have the chance to think and contribute in the educational field.

As stated in the previous section, the teachers have indicated that their needs are met through PD content offered in one-size-fits-all mode. Teachers need more specific and contextual courses in the form of one-size-fits-all approach does not address their needs or the schools’ needs. This result ties in well with prior studies which recognise that the way learners learn is influenced by their experiences, personalities and characteristics (Daniel, 2014). There are multiple learning styles: therefore, all these learning styles must be integrated in each course. Some learners may be fast, while others may be slow in mastering the required skills (Daniel, 2014). Additionally, as Joyce and Showers (1988) conclude in their seminal work, when coaching, study teams and peer support are provided to teachers, their learning and use of strategy increase greatly. Teacher training needs to connect teachers’ “needs and interests to collective needs and interests of the school” (Little, 2006, p. 2). More importantly it is difficult for one-size-fits-all learning environment to cater for these important challenges: (1) helping students’ learning processes; (2) encouraging interaction; (3) incorporating flexibility; and (4) nurturing an affective learning environment which Boelens, De Wever, and Voet (2017) find very important for a new learning environment. To sum up, one-size-fits-all courses need to be replaced with more tailor-made courses which can be offered through blended and online learning, recognising that every teacher, as well as every school context, is unique.

Course duration: as teachers have a busy schedule, course duration can be an influencing element while designing PD courses. Therefore, course duration can be a facilitating or inhibiting factor. In this study, the participants (from both focus group and survey) tend to prefer short courses rather than long ones. So, lengthy duration could be an inhibiting factor influencing teacher beliefs about OPD. There may be several reasons for this, such as their family responsibilities and exhaustion after normal school hours. If they have to attend professional development courses after school hours every day, they will get tired and will not benefit fully from the course. The Ministry of Education must implement new ways of offering professional development for teachers through educational reforms. These courses must be ongoing and related to teachers' needs, so that teachers are free to enrol for professional development course when needed and at their convenience.

There is a contradiction in teachers' beliefs regarding course duration as they agreed that short courses were more effective compared to lengthy courses, but at the same time they believed that intensive and lengthy professional development had more impact on their teaching practices. However, in line with the idea of Pajares (1992), it can be deduced that teachers' beliefs remain a "messy construct" (p. 2). Teachers tend to prefer courses which are spread evenly during the three terms and embedded in their working hours. Whereas, in literature, short courses are seen as a disadvantage. These courses are often seen as fragmented and lacking follow-up, (Borko, 2004), thus offering limited opportunities for teachers' growth (Owston, Sinclair & Wideman, 2008). Even though this study did not replicate the one previously reported by Borko (2004), the results suggest that these courses must suit teachers' busy schedule and be related to teachers' and schools' needs rather than just for policy decisions of producing 'qualified teachers on paper and not as practitioners. But as suggested by Lauer and colleagues (2014) the objectives of these short PD courses must be clear and related to teachers' needs in a collaborative and active environment. On the other hand, Gulamhussein (2013) points out that professional development programmes must be significantly long and ongoing to enable teachers to learn innovative strategies. Darling-Hammond, Wei, Andree, Richardson, and Orpanos (2009), found that rigorous PD which lasted from 30 to 100 hours in a period of 6 to 12-month duration is more effective compared to the one-day or two-day conference or workshop approach in traditional professional development programmes. It is obvious that a one- or two-day workshop is not

sufficient. However, we acknowledge that there are considerable discussions among researchers and there is no overall agreement concerning PD course duration, but more important is to determine the content of the course, and then try to find a balance in the duration.

Therefore, PD providers need to take these elements into consideration while offering PD courses. Moreover, we need to be honest towards ourselves and recognise that teachers have claimed that the courses were too theoretical and not adapted to their context. Therefore, stakeholders need to reform TPD curriculum where teachers' views are taken into account to meet the required objectives. Additionally, standardisation of such programmes needs to be ensured.

Curriculum constraint: the educational system favours elitism as the participants highlighted; therefore, teachers focus more on results rather than the holistic development of the students. This way of teaching and learning implies lecturing and note taking. Teachers tend to imitate the way they themselves have been taught, which has produced the required results even after having followed PD courses. PD courses offered to teachers tend to follow the same trend, as teachers have to learn a lot of theories for the examination which assesses mostly memorisation of theories. It is more about rote learning rather than deep understanding and practical orientation.

PD courses must be geared more towards learning by doing. This finding was confirmed by the results of the survey, as the teachers believe that the curriculum of teacher professional development courses should be adjusted according to teachers' range of beliefs and behaviour. Moreover, teachers believe that demand-driven PD is more appropriate for them. If we continue to deliver the same PD as we use to, it will not necessarily contribute to teachers' advancement. Teachers may complete these programmes in order to be employed and secure their jobs and not just for their professional development as new policy has made it compulsory to take PD courses in the first two years for newly recruited teachers. Therefore, we must find other ways to change teachers' pedagogical beliefs about professional development, to encourage them to go through professional development for professional reasons rather than for just securing a job. As teachers are seen as role models, it is logical that to change the next teacher generation, we need to change current teachers' beliefs about teaching and learning. Furthermore, the professional development programmes

must be restructured to integrate more practical activities and collaboration among peers – these programmes can be embedded in their school hours. No time is being allocated for such activities but it is regarded as a decisive factor in teachers' lives. In summary, the key findings that emerged are: teachers' pedagogical beliefs about OPD must be changed, the content of PD must be related to teachers' needs and should be more practical oriented, PD should be based on collaborative efforts and not on an imposing curriculum.

In the literature, it is claimed that for learning to be effective, it should include theory, demonstration, practice, feedback and classroom application (Joyce & Showers, 1980) which is related to teachers' needs (Avalos, 2011; OECD, 2010). Just having access to theories and strategies is not enough. The training must include classroom demonstration, provide support in the daily teaching and provide feedback to the teachers. Our findings are in line with what Putnam and Borko (2000) have proposed, that experience and future teachers must be in contact with a diversity of learning facilities.

Teacher professional development and students' outcomes: teachers have been spoon-fed, therefore they tend to spoon-feed their students now. Similarly, their trainers tend to spoon-feed them when they go to training sessions during which they are being told to be creative and innovative. Added to that, there is a lot of content to be covered in a given period of time as well as doing revision work. The educational system favours rote learning based on memorisation but in PD courses we talk about holistic learning. The finding is directly in line with previous findings, similar to Baylor and Ritchie (2002) who found that teachers had a tendency to teach their students the way they themselves have been taught. Therefore, educational reform must change educational approaches drastically to prepare students for work and life in the 21st century (Dede, Eisenkraft, Frumin & Hartley, 2016), where not only academic knowledge is needed in a constantly evolving society. Nonetheless, we believe that it is well justified to change the mode of assessment for teachers to be creative and innovative. Indeed, this reform can influence teachers' beliefs about their teaching. As McConnell (2000) has stated, the traditional education model does not promote cooperative learning but encourages competition instead. It is imperative to highlight the point that in our context, due to the factor of private tutoring, this way of teaching has shown positive effects on students' performance. This could explain why teachers do not change their approaches even after having followed professional development courses as current professional development

programmes do not really address or identify gaps in students' achievement. By contrast, literature claims that knowledge gained through teacher professional development influences teaching practice (Blank & Alas, 2009; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Darling-Hammond and colleagues also supported this idea as they found that professional development which is "sustainable and intensive" (2009, p. 43) is correlative to student achievement gains. Therefore, teacher learning is very important to be able to reach the transformation required to achieve the shift to the emerging practice.

7.3 Teachers' conception about online learning

Another key finding that influences teachers' beliefs about online professional development is teachers' conceptions about online learning. These conceptions about online learning result from the benefits of online teacher training, the facilitating conditions available to the users and social influences. With online learning, teachers can view video of real class situations, they can reflect and comment. The participants pointed out that the trainers are not familiar with the school's context. Therefore, they deliver their knowledge using traditional modes such as using book, board and chalk, as a teacher in a classroom, which is inefficient.

Similarly, in literature, it was found that the trainer lacks knowledge about the school context and the classroom realities (Baran & Calgitay, 2006). So the trainer needs to be familiar with the school context, so that the content can be adjusted to the school realities. The result demonstrates two things. First, PD in a concentrated forum is not enough as Hinson et al. (2006) argued. Second, as Reborá (2008) noted, PD in the form of workshop presentation style was inefficient. So teachers develop negative feelings towards workshop sessions (Patton, Parker & Neutzling, 2012). Thus, teachers' professional learning must move towards demand-driven models where teachers are active participants (Lim & Lee, 2014). This can be achieved using OPD which offers the possibility of having co-constructors of knowledge, thus knowledge is created by teachers for teachers, thus reducing gaps in contextualising theories. Therefore, professional development content would be grounded in the teacher's discipline rather than being generic as Gulamhussein (2013) claimed. Brooks and Gibson (2012) find that for OPD to be effective it must be a more personally relevant, meaningful and engaging PD as teachers have the opportunities to 1) choose their learning

experiences; 2) take advantage of the flexibility of the technology; 3) customise the experience; and 4) have space to be reflexive. If these positive characteristics are present the course will enable teachers to reflect on their practices critically and shape their beliefs about content knowledge, pedagogy and the learners, e deepening their understanding about teaching and learning processes, and thus preparing them to cope with uncertainties. Moreover, Mushayikwa (2013) claimed that for a PD course to be effective there should be an interaction between school's needs and TPD needs.

It is not too surprising that evidence of students' performance has a negative impact on online teacher-training usage, because not all the participants were using or had used online learning courses. Also, students' performance is often related to private tutoring rather than normal schooling. This is in contrast with earlier study of Seferoglu (1996) which claims that quality teaching is attained via continuous professional development. The finding is based on their experiences with the traditional PD programmes related to students' performance. Additionally, it is obvious that it is not easy to assess students' performance with regard to teacher professional development in the short term. Students' performance must be assessed with ongoing professional development and in the long term. Regular professional development interactions among teachers have an important effect on PD (Penuel, Sun, Frank, & Gallagher, 2012). Moreover, providing PD for the sake of formality is not enough to change teachers' practices over and above student learning (Darling-Hammond et al., 2017).

Benefits of online teacher training: teachers can carry out their activities without disrupting their professional development when it is online, as some teachers prefer to invest their time in private tuition or other activities which are remunerative as opposed to attending PD courses. Now private tutoring has become a cultural, economic and educational factor. This growth of private tutoring in our context may be due to the fact that education is free. But the idea behind providing free education was to enable every child to get access to education. But now this free education has become a "commodity". Everyone, but mostly those who can afford it, strives to get the best; therefore, they invest in private tutoring, thus promoting competition, which enhances isolation in schools rather than collaboration. But with online learning teachers have the possibility to offer private tutoring besides engaging in professional development programmes. The participants point out that with online

learning, they can manage their time more easily and adapt it to their family life or do other activities. They also believe that online professional development is not a barrier to teachers' offering private tutoring. This may raise concerns about the educational system which can be addressed by proper educational reforms, especially teacher education.

The participants in this study characterise teacher professional development as opportunities to share experiences and resources and discuss with colleagues, a lifelong learning activity, following courses to learn new teaching techniques, theories and other experiences, training to help teachers in managing their classes, helping teachers in mastering their subjects and acquire teaching and pedagogical skills to improve teachers' work. In the focus group discussion, the participants suggested the setting up of a forum where teachers can express their views. It will be a space where teachers can collaborate freely with each other. More than 60% of the respondents believed that OPD provided opportunities for teachers to work in partnership with their peers inside and outside the school. A similar pattern of results was obtained in Huber's (2010) study who found that new technologies appear to have the possibility to create and implement a sustainable, complex and meaningful professional learning environment for teachers in a given school. A participant acknowledges the fact that he or she likes self-directed learning, where there is the possibility to study anywhere, at any time by just connecting to the internet. Thus, there is no need to travel, as online learning provides the possibility to study at their convenience. OPD has to provide opportunities for both types of learners, that is those who preferred social and applied learning approaches (Ramage, 2002), and independent learners who preferred online learning (Ramage, 2002), since teachers' attitude towards PD programmes is influenced by their learning style (Chen & Chiou, 2012). Thus, using an online learning environment, teachers should be able to acquire PCK. Findings from the study indicate that teachers acquired PCK after an online training, thus growing professionally. The teachers participating in quantitative phase of this study agreed that professional development content help them to grow professionally.

Teachers can access the course or content at anytime and anywhere at their convenience using their smartphones or tablets. The learners will not miss anything, even though they are not connected at the same time, so there is no need to online at the same time. Compared to face-to-face mode of learning, if the learner was absent, he or she misses

the explanation and must catch up with the explanation by asking their peers, reading books or searching on the net. This is in line with a previous study which indicated that learning is more self-paced and flexible while targeting teachers' interests and needs (Fontichiaro, 2008). OPD has eliminated many barriers in training of in-service teachers in terms of access and time schedule (Reeves & Pedulla, 2011), since teachers can access just-in-time resources at the workplace (Whitehouse et al., 2006). The trainer does not control information flow any more; now it is the learner that does so (Thomas et al., 2012). According to Albers and colleagues (2016) online can be an important space for teachers to discuss critical issues regarding their work.

The participants wanted to have a forum where they can collaborate through reflection which can be anonymous. Meirink et al., (2007) describe this "sharing of knowledge as particularly powerful in terms of changing practice, as teachers can use the expertise of colleagues to adjust or improve their own teaching practice or to adjust, extend substitute, or supplement their own beliefs" (p. 148). Teachers must be encouraged to work in collaboration rather than in isolation. Since it was found that teachers learn through "practice (learning by doing), through meaning (learning as intentional), through community (learning as participating and being with others), and through identity (learning as changing who we are)" (Lieberman & Mace, 2008, p. 227).

Facilitating conditions: the facilitating conditions available are elements that influence secondary school teachers' beliefs about online professional development. These conditions may be the accessibility and availability of resources, openness and sites. Findings from the qualitative approach were confirmed by the results from the survey, which indicate that the facilitating conditions of OPD is the strongest predictor of online professional development use behaviour of teachers (see Figure 6.2). The more teachers see the benefits of online professional development programmes, the more they will be encouraged to engage in such programmes. If these enabling factors are available, they will have a significant positive influence towards teachers' usage behaviour of online teacher-training programmes; secondary schools depend on governmental support to improve or get infrastructure, for example, technology. Therefore, Enabling factors are viewed as one of the determinants of online professional development acceptance in the conceptual model. Teachers have access to internet resources which are necessary to use online professional

development programmes as stated in the chapter introduction (internet subscribers: 650,800 mobile devices, 212,600 fixed line and 863,400 broadband internet in 2016 for 1.2 million inhabitants) (see section 1.3). However, this indicates that ICT in teacher education is lagging behind internet access. Compared to other developing countries Mauritius has internet connection across the country, but teacher education is lagging behind. Therefore it is not a factor of internet connection. By contrast, internet resources are limited in developing countries (Thomas et al., 2013).

One of the most important conditions needed to facilitate teachers' engagement in online professional development is accessibility and availability to resources such as internet access. Today a ubiquitous device will be more appropriate, so that teachers can access the resources anywhere at any time without worrying about which device they have. One participant stressed the point that not all teachers possess a computer with internet connection at home or even at school. Interestingly, online professional development can be offered all the year round and provide opportunity to the participant to enrol at any time. Having the opportunity to connect to the internet both at home and at their workplace, teachers will be able to access information when needed, thereby decreasing the gap between digital emigrants and digital natives; what is called the "digital divide".

Even though most of the secondary schools (99% in 2014) are connected to the internet, this access to the internet is mostly for the students and restricted in terms of speed. The government will connect these schools with fibre optic to increase the connectivity speed and also install Wi-Fi, therefore, teachers also will benefit. Thus, providers of professional development programmes can take advantage of this by widening professional development access. Teaching seems to look different compared to what it was before even if professional development has not changed at the same speed. But still findings from the study indicate that they need the required resources to use online professional development programmes both at school and at home. This finding was confirmed by the respondents of the quantitative approach. It was found that a few teachers believed that the content and activities of PD were readily available at their workplace, which may be due to the fact that teachers have no internet access at their workplace. But they believe that professional development should be integrated in teachers' daily practices. Teachers can have access to learning resources when required with their mobile phones, tablet PCs or laptops. As

discussed, this is because technological resources are not adequate and neither is the school culture regarding technology. So teachers need to have access to adequate internet connectivity at school as well as at home too for them to access professional development resources even at their workplace. This may explain why teachers are not using OPD and have such beliefs. Overall these findings are in accordance with findings reported by Reeves and Pedulla (2011), who have found that OPD has eliminated many barriers in training of in-service teachers in terms of access and schedule, among others. The lack of internet access creates a new form of exclusion which is one of the most destructive means of marginalisation today (Tondeur, Sinnaeve, van Houtte, & van Braak, 2011).

Education is about sharing and internet has empowered this sharing efficiently as it can accommodate a large audience at the same time. Due to the openness of OPD, teachers can have access to foreign resources which would not be available locally in a traditional face-to-face learning environment. As highlighted by the participants in the group discussions, online learning is not restricted to a country only but open to the entire world: this learning can happen without travelling abroad. There is no need to book a seat as seats are no longer limited as in face-to face sessions during which only a fraction of teachers can participate in the training sessions (de Mesquita, Dean, & Young, 2010; Boehm et al., 2012). In big countries rural teachers tend to have inadequate access to resources (Cady & Rearden 2009; Sawchuk 2009; White & Kline 2012), but it has also been found in the Mauritian context (a small island), not all teachers have access to the same limited resources. The present study confirmed the findings about the openness of OPD in term of distance and number of participants as with OPD teachers can collaborate both nationally and internationally through personalised, practice-focused and community-based learning activities as identified by Brooks and Gibson (2012). OPD provides opportunities to participants, irrespective of their locations, to continue their educational professional growth, pursue their work and personal responsibilities simultaneously (Stanford-Bowers, 2008). The learning resources are no longer available for a limited period (Borko, Whitcomb, & Liston, 2009). Instead OPD seems to offer an unlimited number of options (Lebec & Luft, 2007; Signer, 2008; Russell et al., 2009; Sherin & Van Es, 2009; Whitcomb, Borko & Liston, 2009).

As the course is online, teachers can learn anywhere; therefore the site is no longer a problem. The findings show that the school management must make available the required resources such as time for teachers to access PD at their workplace. Job-embedded professional development can be provided through online learning. We found that it was challenging for teachers to meet in a given physical place in this study, but with online learning time it is not necessary for every participant of a given course to be at disposal simultaneously and at the same place as it is offered in an asynchronous mode which is in line with Russell, Carey, Kleiman and Venale's (2009) work. Ronfeldt and colleagues (2015) found that teachers progress at a greater rate when they work collaboratively in school. This collaboration can happen effectively using OPD, so teachers need support to using such learning tool efficiently.

Teachers in the study believe that they need technical support if they are to engage in online professional development programmes. Teachers tend to concentrate on technological issues rather than the instructional process. Therefore, they prefer to stick with the beliefs that they must master the technological skills before using technology in the process of teaching and learning. Even though we find that the lack facilitating conditions negatively impact on the use behaviour of OPD, even where has been great effort to encourage the use of ICT in classrooms, there has been a minimal effect on teaching and learning even though PCs have been introduced in classrooms since the last 20 years (Reilly & Sandholtz, 2004). To conclude, there is still inconsistent in the finding regarding the effect of facilitating conditions on behavioural intention. Like Jairak et al. (2009), we find a positive influence of facilitating conditions on BI compared to Im et al (2011) or Nassuora (2012) who find no significant effect.

Social influences: findings from the focus group discussions showed that social influences was a factor which influences teachers' enrolment in PD programmes. But the survey result shows that social influences was not a factor which influenced teachers' beliefs about online professional usage. This finding is in line with Nassuora (2012), but researchers such as Im and colleagues (2011) find a positive effect of social factors. This may because teachers tend to work in isolation, as teachers are afraid of being judged by their colleagues, while literature suggests that teachers must engage in professional learning communities which provide opportunities to observe their peers' classroom practices. In other cases,

teachers are being advised by their peers not to follow professional development courses as they will not achieve the intended outcome. This is confirmed by the survey findings which indicate that teachers agree that people who are important to them are not encouraging them to use online professional development programmes. These include their friends, colleagues and school management. But they still believe that their colleagues and friends can influence their engagement in online professional development programmes. This can provide opportunities to discuss and observe each other's classroom practices and analyse their data. Such opportunities help teachers to implement changes more efficiently (Borko, Jacobs, Eiteljorg & Pittman, 2008). The findings indicate that it would be difficult for teachers to participate in such a kind of professional learning because they have worked in isolation for too long as Inger (1993) suggested.

Putnam and Borko (2000) argue that teachers acquire learning experience both inside and outside the classrooms, based on three fundamental concepts: 1) situated in specific contexts; 2) social in nature; and 3) distributed across the individual, other persons and tools. Therefore, the providers of online professional development need to provide training and awareness to those who are already using online professional development programmes and those who are keen to enrol in such programmes. There is still no common agreement on whether social influences impact on teachers' intention behaviour or use behaviour of online PD.

7.4 Implementation

The way online professional development is implemented, is the last key finding that impacts on teachers' beliefs about online professional development. PD programmes in the actual face-to-face mode need to be reformed; therefore, an alternative to face-to-face PD is needed. We face a lot of challenging beliefs while implementing OPD, so we must be able to cater for these challenging beliefs while implementing more adaptive PD programmes for secondary school teachers. These challenging beliefs are the recognition of formation and informal learning, online teacher-training use behaviour, unfamiliarity with OPD which is related to teachers' capability beliefs, self-discipline and motivation and school context. The participants emphasised the mismatch between theory and practice, meaning that what is being learnt in theory is often not the focus in practice. The findings from the focus group

discussions regarding the content of current professional development programmes were confirmed by the quantitative analysis. The participants claimed that they learnt a lot of theory which could not be implemented in their context. These findings were confirmed in the quantitative approach.

When comparing our results to those of older studies, it can be noted that other researchers have emphasised the point that PD should be integrated in curriculum, classroom and school (Killion, 2007; Killion & Williams, 2009). This view was further supported by Lyndon and King (2009) who added that PD must focus on curriculum needs, connected to the goals of the school to be characterised as effective PD. The trainer must not only deliver content but also show the trainees how to teach and apply the different strategies in classroom situations. Teachers in the study agreed that the content and activities of OPD helped them to improve their teaching. This belief is referred to as pedagogical beliefs as discussed in previous section. PD needs to be re-conceptualised towards a more practically oriented model (Sang et al., 2010) for changing teachers' pedagogical beliefs about OPD which are quite stable and resistant to change according to Hermans and friends (2008). This is because these beliefs are formed during their life as pupils in classrooms (Richardson, 2003). As the participants point out in the focus group interviews, the trainers treat in-service teachers as secondary school students. Teachers are treated in the same way as students in PD courses. This tends to embrace what literature says, that teachers' beliefs replicate what they think and do (Johnson, 1994; Phipps, 2007) in their classroom. It is therefore important for teachers to experience their own professional development framework. It is now time to implement PD which would help teachers to move out of this vicious circle. The researcher believes that OPD has the opportunities to help in changing such a situation, as in OPD teachers can take control of their own learning.

PD programmes must include practices as well as theories. The participants make it clear that what is offered in the PGCE course (teaching practice) by the local institution should be integrated into the online course. But they also believe that PD training courses cannot be only online. As such researchers claim that OPD can provide opportunities for teachers to observe their colleague practices which are useful to them (Brooks and Gibson, 2012) using videos as support to observe their colleagues' practices (Brunvand, 2010) and showing classroom situations (Sherin & van Es, 2005). This is a way of connecting theory

to practice (Wang & Hartley, 2003) which is one of the main challenges of online teacher training. There is a need for PD programmes to be standardised.

The quotes from the participants and results from the survey are in accordance with the literature which makes it clear that theory and practice cannot be isolated. This finding supports Dell, Hobbs, and Miller's (2008) work, where they maintained that teaching theory and practice need to be combined effectively in an ongoing teacher education programme. Teachers and instructors have the possibilities to "have multiple and ongoing opportunities to make connections between what they learn in their courses and what they do (in their own classrooms)" (Dell et al., 2008, p. 609).

The participants in the study proposed that PD content cannot be only theories that contain content knowledge but also PCK. Online professional development offers the possibility of merging theory and practice. Videos can be used as learning and teaching tools in teachers' PD programmes. Teachers can access lessons or activities that they feel important for them at their convenience, the same audio-visual content supports different learning styles and reinforces concepts, as the online material can be used again and again. Actually, traditional pedagogies are no longer suitable to offer teachers the needed skills according to a World Bank (2003). In a study (Darling-Hammond et al., 2009), teachers state that they prioritise professional development which is about the content they teach and value training that is content-specific, that is, increasing teachers' knowledge of how to engage in specific pedagogical skills and how to teach precise content to students. Such PD programmes have been shown to improve both student learning and teacher practice according to several studies (Blank, de las Alas & Smith, 2007; Cohen & Hill, 2001; Lieberman & Wood, 2001)

Teachers in this study claimed that they needed more contextualised supports in their daily work. The respondents from this study believed that PD should focus on how to teach. In line with former studies from the results it is concluded that workshops and training should not be the sole components of professional development courses which confirm the work of McConnell (2013) as well as Kafyulilo (2014) among others. Thus, professional development needs a variety of different approaches to be effective (Armour & Makopoulou, 2012). Training, seminars and workshops should be followed with continuous support (Borko, 2004; Lumpe, 2007); which Kafyulilo (2014) asserts that in practice it is difficult

for organisers of workshops and training to offer follow-up to teachers attending these programmes. However, by using online learning, support can be obtained as and when required; this belief is referred to as context beliefs in the literature. Adding to that, Day and Sachs (2004) argue that the ineffective CPD model must be substituted by another model that acknowledges teachers' needs to be involved in continuous learning occurring throughout the school learning communities. Therefore, there is a need to develop professional learning communities or networks. Thus, the role of OPD is to provide coherence, relevance, challenging and progressive professional development for teachers which will promote autonomous and independent learners. But teachers tend to believe that blended learning is only traditional face-to-face learning that integrates digital resources and online learning should mirror classroom learning. As a result, teachers will not effectively benefit from these models of learning with such beliefs. Professional development offered in blended and online modes therefore fails to provide teachers with rich pedagogical strategies.

A teacher points out that even if there are no practical sessions and class visits, the online course remains one of the best courses she has ever followed as it was so rich in terms of resources. But almost all in-service PD programmes are offered in one-size-fits-all structure where all the participating teachers have access to the same PCK irrespective of their needs. Moreover, it is difficult for the resource person to know and take into consideration the school contexts. As discussed in previous section, one-size-fits-all PD courses are not effective as school contexts are different. Research in developing countries has shown that teacher education programmes delivered using a general structure were ineffective (Avalos, Tellez & Navarro, 2010). So PD's curriculum should be adjusted according to the participants' range of behaviours and beliefs to be more effective (Borko, 2004; Desimone, 2009; Hunzicker, 2011; Lieberman & Pointer Mace, 2010; Vescio, Rossa, & Adams, 2008).

Online teacher-training use behaviour: online teacher-training use behaviour is one of the most important elements when designing OPD. Online teacher training can be through formal and informal learning approaches which extend the availability of teacher training. These open online professional development opportunities can be through blogs, wikis, shared lists of resources and social networking sites. Teachers can schedule blogging

time with their peers, thus taking control of their learning pace while removing barriers such as time, distance and economics. Online learning also extends beyond just learning; it enhances thinking as a result creativity. So for using this tool for their professional development, less effort must be needed for teachers to complete the activities and the tool must be able to improve their work.

From both the focus group discussions and the survey, it was found that the participants agreed that online learning can be a benefit for teachers as a tool to expand their knowledge through sharing of good practices. One participant stressed the point that she has loved online courses for their richness. But still there is no agreement about its form, as some participants are at ease with online learning while others believe that the course cannot be totally online. The main issue is that they expect all the aspects of face-to-face mode to be available in the online mode, which can be very challenging. These findings tend to extend what other researchers such as Moskal, Dziuban and Hartman (2013) found about blended learning with which researchers and practitioners are still struggling. But Spanjers et al. (2015) found that it provides several new opportunities to boost teaching and learning.

Institutions providing online training for teaching and learning need to cater for the staff as well as the students for them to use it effectively, thus maximising participants' benefits from the online training programmes. Furthermore, to increase teachers' engagement in online teacher-training programmes, the concept and perception about the training must be changed. Teachers should be able to access the training programmes in relaxed mode, without any time schedule and structure in the same way as the social media that they are used to. More importantly, teachers must be able to see their interest and intrinsic motivation while following these training programmes. They must also be ready to share their knowledge and experiences in a system which has always promoted competition in education as well as in the workplace to get promotion or other benefits.

Teacher participants in this study believed that online courses can be an alternative in providing a specific course as opposed to face-to-face courses. Therefore, online learning offers the option to link theory to practice as real-life conditions in the form of video can be used as learning support. This support can be used as and when required without travelling. Thus, online learning has the capacity to extend what face-to-face is actually offering, since online learning provides the opportunities to combine theory with practice. Moreover, the

resources can be used over and over again. But effort expectancy needs to be reduced, the applications must be readily available on the screen. If this approach can be employed in online professional development, teachers' self-efficacy beliefs about online professional development usage can be boosted. Low effort expectancy implies higher self-efficacy beliefs.

Formal and informal learning: before engaging or enrolling in professional development courses, teachers ask different questions. Some of the most important questions are: a) Are they recognised? b) Will I get a certificate or salary increase at the end? c) How much salary increase will I get? These answers are highly determinant. If the professional development course is recognised and they receive a salary increase after the completion of the course, they will tend to engage more in teacher professional development. This is because, they are investing their time and finance in training courses, and they expect to be remunerated in return, whether the course is formal or informal. Some courses are delivered informally, mostly in an online learning environment, where learning tends to be more informal, for example, through interaction with peers. As such, findings from the study suggest that informal learning and online professional development must be encouraged. In the focus group discussion, the participants contended that more learning takes place informally.

More than 80% of the respondents from the quantitative approach agreed that online professional development must be recognised, whether formal or informal. This substantiates what the qualitative approach has found. Therefore, more teachers will be encouraged to engage in online professional development. This confirms what Ito et al. (2010) find in their study, as they argued that most often learning occurs outside the formal educational setting, as learning is happening every day when the learner interacts whether it is online or offline. Robinson (1998) makes it clear that the effectiveness of PD will be weakened if it is not remunerative. This finding contradicts Lebec and Luft (2007) as they contend that in OPD teachers are motivated by intrinsic factors compared to extrinsic rewards as course credits. In some countries CPD is related to career advancement and salary increases (De Vries, Jansen, & Van de Grift, 2013), but in others participating in continuous PD is not related to salary increases; CPD is part of their duty (Scheerens, 2010).

In the Mauritian context there is no promotion, the participants claimed. Teachers get a salary increase only after completing a Bachelor's degree or a Master's degree if they are already in-service. But if someone joins the teaching profession with a Master's degree, the salary will be the same as someone with a Bachelor degree. Additionally, a teacher will get a salary increase when completing a PD course if the content covers 50% of the subject the teacher teaches. This factor can be an important source of demotivation as teachers' academic achievement is not being recognised. Training is based on the subject content and a small amount on pedagogical competencies (Clercq & Phiri, 2013). Unfortunately, teachers are not viewed as professionals even though they are the key to improving learning in Mauritius. But in Singapore the teaching profession is viewed as a respected profession (Bautista, Wong, & Gopinathan, 2015). Indeed, teachers are valuable resources that mould the workforce of a nation. So in Mauritius also, teachers could be recognised as professionals, and of course they must update their skills continuously.

Previously the MIE in collaboration with local universities offered recognised PD courses. Now the MIE has become a stand-alone certification institution that is it can award PGCE as well. This is the only PGCE award which is recognised in the Mauritian education sector. The participants stress the standardisation of PD courses so that teachers have choices and because seats are limited at the MIE. In line with these findings, Singh (2012) argues that the recognition, validation, and accreditation of MOOCs and OTPD as new ways of learning are vital aspects in encouraging lifelong learning. This can boost up the participation of teachers in PD courses such as MOOCs. An analysis by US Department of Education (2002) proposed that teacher cognitive and verbal ability and content knowledge are more essential than certification or a Master's degree. Oye and friends (2011) claim that ICT can be used to promote quality distance education. If the online course is recognised, then teachers stand a chance of getting a salary increase after completing the training successfully. As this type of course is increasing and teachers are engaging in them, we must find ways and means to standardise and recognise such courses.

In Mauritius e-learning is still in its infancy, even though the government is deploying internet infrastructure across the country. But investing in infrastructure alone will not benefit either the teachers or the students. Collaboration among teachers results in better teaching and learning outcomes and happens within and outside the school. As time

progresses, e-learning is becoming more popular and more recognised (Oye et al., 2012). Therefore, if informal learning, as informal learning, is recognised as professional development, teachers will become self-directed learners who have control on their own learning. Teachers will learn depending on their needs while reinforcing their engagement. Additionally, their peers can help to resolve specific problems through collaboration (Lieberman & Mace, 2010). Teachers' satisfaction with informal learning highly influences the perceived usefulness of this approach to learning.

Teachers also believe that more learning occurs through informal learning rather than formal learning. But the system focuses on formal learning. The survey confirms the findings of the focus group discussion. Teachers believe that informal learning must be recognised as a means of lifelong learning. In the literature, researchers value informal learning through what is called community of practice. Brown and Duguid (1991) used this term to describe informal teacher interactions. Teachers ask questions, provide solutions, construct answers together and discuss changes in their work. Klein (2007) argues that communities of practice can offer valuable training for new members. Teachers, therefore, must not engage in professional development only to get a certificate but to get most out of the course.

Unfamiliarity and course structure: Teachers are not using OPD as they are used to the traditional professional development. They tend to be afraid of the unknown as the participants from the focus group acknowledged. Therefore, the user of OPD must know some basic concepts about learning online. Otherwise, this tends to cause a refractive effect towards online learning. The argument that teachers are afraid of the unknown was endorsed by the respondents of the survey, as about 70% of them agreed with the statement. Therefore, as teachers are used to the face-to-face approach, they would find it challenging to change from face-to-face to online learning.

The majority of teachers are not familiar with online learning as they have always evolved in the traditional learning environment. Teachers with several years of experience tend to find it difficult to find their ground using the internet. They must first learn how to download or upload materials or even search on the web. The instructions of how to carry out basic activities can be delivered through face-to-face meetings, so they can feel more comfortable. But, being the deliverers of knowledge, teachers find it difficult be learners themselves.

Kim et al.'s (2014) finding goes in the same direction as the researcher's, as they found that the learners learn more with technologies which they are familiarised with for easy access.

In online learning, learners' self-efficacy is viewed as a critical factor (Cho & Jonassen, 2009; Cho, Shen, & Laffey, 2010). If the learner is confident about her or his computer self-efficacy, this will positively influence the relationship between online technologies and the online academic achievement of the learner (McGhee, 2010). For learners to be successful in online professional development, an important factor is needed that is "familiarity with technology" (Vu, Cao, Vu, & Cepero, 2014, p. 126). But Bétrancourt (2007) has highlighted the paradox between "Familiarity with technology" and its pedagogical application in the classroom. She argues that even if teachers' technical competences have increased over the last years, the pedagogical implementation of ICT has remained constant in classrooms. These findings supported Doering, Hughes and Hoffman's (2003) findings which noted that even after PD courses, students often feared the use of technologies, thinking that they were not technology experts. It can be concluded that computer skills of teachers are an important construct for an effective OPD implementation as Reeves and Li (2012) noted in their study. Therefore, this study reveals that effort expectancy has a significant negative effect on the teachers' behavioural intention to use online professional development. These findings suggest that teachers believe that they will need a lot of instructions to be able to engage in online professional development programmes as they think these programmes will be unclear, ambiguous and not easy to use. Furthermore, they believe that they will need the required skills to use online professional development programmes once they are implemented. Therefore, OPD providers must provide opportunities for teachers to acquire such skills before offering such courses. To weaken these beliefs, providers must develop user-friendly online professional development programmes which need less effort.

On the other hand, about 70% of them agree that tasks and activities in online professional development courses can be tackled by teachers of all age categories. In contrast, according to literature, teachers can find it difficult to navigate through complicated websites (DeTure, 2004). Teachers may hesitate to move to online learning if there is a lack of confidence in gaining the required skills to interact successfully with the new online

approach (Muilenburg & Berge 2005; Tallent-Runnels et al., 2006), since IT literacy is not equal to success in online learning. Moreover, most of the teachers are digital immigrants, and feel that they are lagging behind in term of technology skills compare to their students who are digital natives. More than three quarters of the teachers completing the survey were digital immigrants and are supposed to need support in an online environment. They believe that they must have technical skills before using technology in the teaching and learning process.

Experienced teachers think that young aspirant (novice) teachers tend to be more technology oriented as most of them are digital natives. In the 21st century more and more institutions offer online courses. Therefore, whether experienced or novice teachers, all have to change their beliefs towards online courses or new technologies, as it is not only the concern of teachers who are new to the teaching profession. Bétrancourt (2007) pointed out that there is no difference regarding ICT usage among newly trained teachers and more experienced teachers. She also added that the idea that younger teachers who are digital natives and are used to technologies will be more comfortable in introducing technologies into their pedagogical practices is false. In literature this is referred to as capability beliefs. On the other hand, Vu et al. (2014), find that “successful online learners in an online professional development course are in the age range of 25-34 years old” (p. 130). In this study, even though the age range of the study participants is of 25 to 45, which is not far from what Vu and colleagues mention, the participants still claim that it is about generation. It may be true due to the non-representative sample. But professional development must help teachers to unlearn unconscious beliefs as well as learn new skills. Otherwise, teachers will continue teaching the way themselves were taught as teachers are viewed as role models.

Even though teachers are using both laptops and smartphones to access the internet, they claim that they are unfamiliar with internet conventions, and even though we are in a digital world not all teachers in our schools have access to the internet at their workplace. The government must provide more facilities to teachers so that they can access the internet even at schools, so that they get used to it. The more teachers get internet access, the keener they will be to use the internet in their teaching as well as their professional development.

Technology may not be the major problem as in reality teachers are using smartphones with which they access their mail, read newspapers or send messages using

applications like WhatsApp. Therefore, the researcher speculates that the reason might be due to the action of learning online because most of the students are used to a spoon-feeding learning approach. We are living at a time where one is instantly accessible through mobile phones, emails or video conferences. Therefore, there is a need to transform teacher professional development to be able to adapt to with these changes. As identified by Boyd (2004), the factors to be considered to be a successful online learner are: firstly, the learner must possess the proper equipment and the skills to effectively use the technology (technological factors); secondly, the learner must be able to manage time and space as well as other support (environmental factors); thirdly, the online learner must be autonomous and interactive, self-motivated and self-disciplined, and have a high level of integrity (personal factors). There is an assumption that adults are autonomous and self-directed learners (Knowles, 1968). But Knowles has failed to consider “the product of the socio-historical and cultural contexts of the times; nor is there any awareness that social institutions and structures may be defining the transaction irrespective of the individual participant” (Merriam et al., 2006, p. 88) when characterising autonomous learners. More recent studies insist on the point that self-efficacy beliefs are key elements to determine teachers’ intension to use technology (Scherer, Siddiq, & Teo, 2015; Teo, 2011). Furthermore, self-efficacy beliefs correlate with the quality of teachers’ instructions (Holzberger, Philipp, & Kunter, 2013; OECD, 2014; Zee, de Jong, & Koomen, 2016).

Self-discipline: self-discipline is considered an important element while learning online. As we are moving towards online learning, we must develop the awareness of self-discipline. The participants contended that self-discipline is one of the major factors that influence teachers’ beliefs about online PD as they maintain that without self-discipline it will be very difficult for teachers to engage in online PD programmes. Teachers need to learn on their own in online learning compared to face-to-face. The statement corroborated the findings from the survey which stressed that self-discipline is an important factor that influenced teachers’ usage of online professional development. This finding is in line with previous results obtained by research such as Boyd (2004); Beaudoin, Kutz, and Eden (2009) who observed the importance of self-discipline in online learning. More recently Vu and friends (2014) have confirmed the important role of this factor while studying online as the learners have the option to work alone in online learning (Sawchuk, 2009).

Motivation: the participants pointed out that the professional development activities were too theoretical and therefore did not assist in addressing their problems. Therefore, they were not motivated to follow PD courses even though the objective of professional development is supposed to offer teachers with resources to improve or change their classroom practices to improve students' learning. Teachers can have all the facilities to participate in online professional development programmes, but if they are not motivated, even online programmes will be the same as in face-to-face PD programmes. Knowles (1968) pointed out adult learners can be characterised as intrinsically motivated as they have strong tendencies towards what and how they want to learn. The motivation can be intrinsic (e.g. beliefs, self-efficacy) or extrinsic (e.g. salary, infrastructure). Sowder (2007) contends that teachers need support of appropriate professional development in order to meet their demands and also additional educational policy demands. Similarly, Guskey (2000, 2002) found that one of the reasons why teachers may not be motivated to follow professional development courses is that many professional development courses are ineffective. But, several questions remain unanswered. Firstly, why do professional development programmes often fail? Secondly, what motivates teachers to engage in professional development?

Most new comers in the teaching profession have a Bachelor's degree, which is above the required condition to teach in a secondary school. Sometimes many young people join the teaching profession for diverse reasons such as long holidays or lack of other possibilities. They have got a job and they are happy. Thus, they are not willing to engage in PD programmes. Therefore, ways must be found to encourage them to engage in professional development programmes.

As professional development programmes are too theoretical and not related to their needs as well as to students' needs, as discussed in previous sections, teachers prefer to invest their time in private tutoring for their students as they believe that both teachers and students are benefiting, rather than attending PD courses. However, professional development programmes do not seem to improve students' performance in our context. The government is trying to stop private tutoring by enforcing laws. For example, teachers pay tax on the money obtained from private tutoring. But due to limited resources it is difficult to investigate the income obtained from private tutoring and the conditions in which private

tutoring is happening. Therefore, as stated by the teachers participating in the study, they need some motivating factors such time and finance to engage in professional development programmes. Others have shown that the government, school administrations, and educators have done a lot to improve teachers' participation in professional development, but this participation differs broadly (Aarts and Waslander, 2008; Diepstraten et al., 2011; Van Driel, 2006; Vogels, 2009). It appears that teachers participate less in reflection activities as opposed to keeping up to date their knowledge and skills or collaborating (Dijkstra, 2009; Kwakman, 2003; Van Eekelen, 2005). Findings from some research have shown that students have been able to manage their time and become autonomous learners who direct their own learning (Mohammad, 2012; Rodgers, 2008; Singh, et al., 2005). As the learners interact with the online learning programmes, they develop a wide range of technical skills (Daniel, 2014) which reinforce their motivation in using online professional development. But ICT literacy does not necessarily translate into the capability to learn effectively online.

School context: school management has to provide time and possibly also the infrastructure, for example, Wi-Fi for teachers to access PD resources such as observing their peers in a classroom situation or share best practices. In fact, more than 90% of the participants believed that the school must provide opportunities for teacher professional development. They also thought that the school must allocate time slots for collaboration among teachers within and outside the school, because in our educational system there is no time for this collaboration as we are more examination oriented. The researcher's findings on the school infrastructure and culture at least hint that the school culture towards technology needs to be altered, as according to the school's regulations the usage of technology such as mobile phones by the students is prohibited on the school premises.

The results provided evidence that teachers' pedagogical beliefs are formed since their life as students. Therefore, for the future generation of teachers to change their pedagogical beliefs, current teachers have to change their beliefs, for example, by encouraging collaboration in the classroom using technologies such PC tablets or mobile phones. In this rapidly changing world, teachers can play a critical role in transforming education using technology. Ongoing professional development through technology can help teachers to create knowledge to respond to their learners' needs, even if the newly employed teacher has gone through some pre-service teacher-training programme, as the teacher

evolved in the school culture which has been established for years by the former and experienced teachers. The experienced teachers would advise the teacher to follow what they are currently doing. Since teachers' beliefs influence their behaviours (Ajzen et al., 1986), affect their practices and decision making (Ng, Nicholas & Williams, 2010), teachers' beliefs need to be changed. Only then will change occur in their behavioural intention concerning the use of technology for their professional development.

An alternative to providing PD can be OPD for the teachers where teachers can share best practices, as the school does not offer opportunities for teachers to engage in PD. This is because the school management has to provide time and also the cost incurred for hiring an expert to come to the school. Moreover, in this study, the participating teachers claimed that the expert does not know the school context. So, using OPD, teachers can be their own trainers, thus eliminating the situation where the trainer does not know the school context. Moreover, the PD contents are available to teachers at their workplace which is directly in line with what Whitehouse and colleagues (2006) pointed out. A high percentage of teachers in this study agreed that teacher professional development should be embedded in their daily practices as they need immediate response with respect to their working context. This is consistent with what has been found in prior studies, that is, if PD is embedded into teachers' daily practices, it is more likely to influence their beliefs (Lawless et al., 2007; Rienties, et al., 2011; Stes et al., 2011; Stes et al., 2010). Mushayikwa (2013) has made it clear that school should provide the required professional development activities so that teachers can adjust or change their practices regarding the changing needs of their students and be up-to-date with current issues in their discipline.

In this study, performance expectancy was no longer the strongest predictor of online professional development acceptance as Wang and colleagues (2009) found in their study (see Figure 6.3). But it remains a significant predictor of online professional development usage. Moreover, in contrary to Im et al. (2011) as well as Nassuora (2012) performance expectancy has no influence on BI to use OPD. Teachers will believe that online professional development is useful, if online learning activities will enable them to accomplish more effectively and improve student outcomes. But findings from this study suggest that teachers believe that online professional development will not improve their teaching, as they work within a system which does not emphasise professional development of teachers.

Furthermore, the beliefs of experienced teachers are more difficult to change, as they think they are productive even though they have not followed any professional development programmes. The trainers and the professional development providers must pay attention to the quality of learning resources deployed for teachers to facilitate teaching and learning. Online professional development must cater for all their needs for teachers to change their beliefs about online professional development. Moreover, educational reforms must focus on teacher education in the future. When teachers from the same school, department or grade participate collectively in professional development programmes, this collective participation changes teachers' practices more effectively (Desimone et al., 2002). As Penuel and friends (2007) reported, more changes happened when all teachers in the department or grade groupings, or all teachers in the school or set of schools engage in teacher professional development. One way of providing such PD is through OPD. To conclude, using technology, professional development is moving towards a more contextualised approach which enables teachers to create adaptive learning environment in line with the learners' need instead of a one-size-fits all approach.

7.5 Comparing the conceptual frameworks

Three conceptual frameworks have been developed during this study. The initial conceptual framework (CF1) combined aspects of the UTAUT model and teacher learning model to obtain a theoretical lens for exploring the phenomenon of teachers' beliefs about online professional development programmes. The model was used to gather data using focus group interviews to explore the factors that enabled or inhibited teachers' beliefs about online professional development. Moreover, to offer a deep understanding of teachers' beliefs about OPD and why they have such beliefs, CF1 was used. After analysing the data gathered from this qualitative approach, it emerged that effort expectancy, performance expectancy, facilitating conditions, type of content and activities as important factors that must be taken into consideration while learning online – in this study teachers learning through online professional development. Effort expectancy remained a significant factor affecting teachers' behavioural intention to use online teacher-training programmes even though we are living in a digital society. Two other constructs (teacher experiences with OPD and challenges of online teacher training) were introduced in the model as these two

constructs were significant contributors that influenced online teacher-training use behaviour. In this study, the dependent variable use behaviour has been renamed as “online teacher-training use behaviour”. The terms are used interchangeably in this study. This amended conceptual framework was used in the quantitative phase to gather data from the respondents via a questionnaire. A further change to the conceptual framework emerged after performing regression analysis on the quantitative data, which better fits the data. It consisted of seven constructs; the model can predict 93% of the variance in predicting online teacher-training usage. Moreover, performance expectancy and content and activities contribute significantly to the prediction of online teacher-training usage, whereas knowledge and beliefs, teachers’ experiences, challenges of online teacher training and social factors were not predictors of online teacher-training usage. The model showed that effort expectancy was a good predictor of online teacher-training usage rather than predicting behavioural intention to use OPD as in CF1 and CF2. But CF2 came from the qualitative phase and CF3 from the quantitative phase with a sample size of 65 respondents. Future research could be done using a larger sample size. Moreover the constructs can predict 73% of the variance in predicting behavioural intention to use OPD. By combining UTAUT model and teacher learning model, we can predict 93% of the variance in predicting online teacher-training usage compared with UTAUT alone which can predict 70% of online usage. Moreover, this new model can predict 70% of the variance in predicting behavioural intention to use OPD. Figure 6.4 shows that performance expectancy and effort expectancy were predictors of online teacher-training usage. Additionally, facilitating conditions was a predictor of behavioural intention to use online teacher training.

7.6 Synthesis

This chapter has dealt with the findings and discussions, while provided depth to the outcomes of Chapters Five and Six in the context of Chapter Two, the literature review of this study. The findings were compared to those of the literature to see whether these confirmed or extended existing literature. It has tried to look at the findings using a combination of teacher learning models and UTAUT as a lens. This relevant conceptual framework was used to explore teachers’ beliefs about online professional development. The combination of teacher learning model and UTAUT has been able to explain the variance in

predicting online teacher-training usage (use behaviour) to 93% compared to 70% for UTAUT only. This difference can be attributable to the combination of the two models in this study. Some questions have been raised that could be useful for upcoming research, because no answers could be provided for such questions within the scope of the actual study. This research has opened debates that would possibly add to the expansion of knowledge and theory. Moreover, more research using larger sample size in the same or other contexts could be done to validate the model obtained in this study. The quantitative approach had strengthened the qualitative findings as highlighted in the research methodology chapter. The respondents were neutral with only three sub-themes, namely course duration, social influence and health problems. The study also showed that for the conceptual framework obtained from phase one, the respondents were neutral with only social influence and agreed with the others. These results needed to be tested and validated using a larger sample and using the same and other statistical tools like SEM. As stated in Chapter Six, the other constructs did not significantly influence teachers' beliefs about online professional development.

CHAPTER EIGHT: SYNTHESIS AND CONCLUSION

8.1 Introduction

An earlier chapter of this study discussed and presented the results of the beliefs of the participated teachers. This final chapter focuses on summarising the research problem and discussing the findings, highlighting the limitation of this study and presenting the research conclusions. How the beliefs of teachers influence their engagement in online professional development programmes was the subject of this research effort. No effort was made to specify the percentage of the total number of teachers that are presently using the online learning. Instead the research consider deeply the sample of teachers who are using or plan to use it later on and the elements that impact their future decision to adopt OPD for their professional development. It also tried to address the issue of how to reduce the inconsistency between the positive reaction of teachers towards online teacher-training programmes and their engagement in online teacher-training.

The research set out to answer the following research questions:

1. What are the secondary school teachers' beliefs about online PD?
2. To what extent the facilitating and inhibiting factors influence secondary school teachers' beliefs about OPD?
3. How are secondary school teachers' beliefs about OPD constructed or enabled?
4. Why do secondary school teachers have such beliefs about OPD?

This chapter consists of seven sections. **Section one** is an introduction to the chapter. **Section two** deals with a summary of the findings. **Section three** deals with the implication of the research findings. **Section four** explains the contribution of the research. **Section five** discusses the study limitations. **Section six** makes recommendations for future research, while **section seven** presents the implication of the findings for practice.

8.2 Findings of the study

This section recapitulates the key findings that emerged from this study related to the research questions. Technology has changed the way people live and work in the society, and education has not been spared by this change. But ICT will not transform education

overnight (Peters, 2017). Educators, societal leaders and policy makers must find and apply the required solutions to change education (Aesaert et al., 2013). As Mishra and Koehler (2006) point out, teachers need TPACK. This is why teachers' beliefs about online professional development have been explored. From the qualitative approach, the researcher was able to find the factors influencing teachers' beliefs about online professional development. These factors were classified as facilitating and inhibiting factors. The findings of the study are restricted to Confessional secondary school teachers. We can see that the current method of delivering professional development, which is in a general trainer-oriented mode, is viewed as being ineffective for teachers and is in line with the literature discussed in Chapter Two. Teachers need more contextualised professional development which is related to their daily needs. Since teachers are themselves learners, they have individual needs. They believe that the content and activities of OPD influence their usage of OPD. Therefore, their training needs to be trainee-centred rather than trainer-centred. Teachers believe that effort expectancy is a significant factor to be considered while engaging in online professional development. Surprisingly, this tends to be the case for young teachers also, even though they are digital natives. Evidence of students' performance has a negative influence on teachers' belief about online professional development usage. The teachers believe that social influences have no influence on their usage of online professional development. As far as the researcher knows, this is the first adoption of the UTAUT model and its combination with teacher learning model in relation to online professional development in the Mauritian context. Therefore, the findings of this study are unique and also instructive concerning technology acceptance in general.

8.2.1 Secondary school teachers' beliefs about online professional development

The first critical question was answered by the focus group interview. This section described the findings of the group interview exploring key issues surrounding teachers' beliefs about online professional development. The focus was on current teachers' beliefs about OPD at secondary school level. The findings were categorised and discussed in Chapter Seven. Teachers' beliefs about key roles of online professional development, their beliefs about the role of online learning and about technology and age were the main categories that emerged from the secondary school teachers' beliefs about online

professional development. The categories represented the aspects of secondary school teachers' beliefs about online professional development. Teachers' beliefs remained a messy phenomenon and a difficult one to have a common definition as claimed by Pajares (1992).

8.2.2 The facilitating and inhibiting factors that influence secondary school teachers' beliefs about OPD

Table 8.1 below shows the facilitating and inhibiting factors that influence teachers' beliefs about OPD. The inhibiting factors can be reduced through a good planning before the implementation of such TPD system.

Table 8.1: Factors influencing teachers' beliefs about OPD

Enabling factors	Inhibiting factors
Benefit of online teacher training	One-size-fits all
Recognition of informal and formal learning	Course duration
Professional growth and progress	School context
Motivation	Social influence
Facilitating conditions	Unfamiliarity
Implementation	Course structure
Self-discipline	Health problem
Teachers' conception about online learning	Authenticity of students' work
Teacher professional development and students' learning outcomes	Curriculum constraint
Theory versus practice (perceived usefulness)	

8.2.3 The construction of secondary school teachers' beliefs about online professional development

The teaching profession is seen as noble in general, as teachers hold multiple roles during their daily work. For example, a teacher can act as a counsellor and switch to being

an educator. They educate children who are not theirs. But in Mauritius, the popular belief is that the teaching profession is seen as a “light job” or “effortless job” because teachers have holidays and also work for about six hours daily. Even though the salary is not quite as attractive as in other professions, many people want to join this profession. Sometimes people join the teaching profession just to secure a job as there is a difference between the demand and offer of jobs in the labour market. Another school of thought considers the teaching profession as a vocation. But teaching is not just a job where only performance is recognised; it is what we call the “school of life”, as what the students learn can influence their lives forever. They are involved in the creation of a labour force and leaders for the country. That is why teaching must be recognised as a profession like other professions. Thus, people will be happier to be a teacher, but to be a teacher is not the ultimate goal; it is only the beginning of a long journey.

As being a teacher is also to be taught how to teach, teachers must have the opportunities to participate in professional development. The professional development programmes must be delivered in different modes, for example, online learning so that all teachers can have access to these programmes without any barriers. Teachers must be in touch with the newest innovations in the field of education so as to be able to cater for students’ needs. Another way to value the teaching profession can be to provide opportunities for teachers to participate or attend international conferences in education. In the researcher case, the researcher had the chance to participate in an educational conference as a PhD student; otherwise it would have been very difficult as a teacher to participate in such a conference. This was a very enriching experience, where the researcher met many people in the educational field, researchers as well as teachers. We could share our views and experiences, but very few teachers have these opportunities throughout their career. Professional development of teachers is an essential aspect of effective teaching which consequently contributes to students’ learning outcomes. Therefore, teachers must continue their learning throughout their professional life. Some professional development programmes are being offered online or in blended mode (which is a combination of online and face-to-face) thus, removing time and space barriers (for example, the Educators’ License course offered by the MIE). Teachers can access just-in-time resources anywhere. Thus, there is no need to travel long distances to attend PD courses. Offering PD courses

online will mean that more interested teachers will have access to these OPD courses. Moreover, space can be provided through online professional development for teachers to voice out their views, mostly for those who are unwilling to speak in face-to-face settings as it has been mentioned in the focus group discussions. This can occur formally and informally. As it has been pointed out in previous research, access to informal professional development programmes encourages self-directed learning (Alhabahba & Mahfoodh, 2016).

To be able to understand how teachers construct their beliefs about online professional development, we must answer this question. What is the purpose of professional development for teachers and for the providers of such programmes? For teachers it can just be to get a certificate or because they have been asked to do so, since at the end of the programmes, teachers continue to teach as they used to do before. If teachers continue to act like this, it will be the same for any professional development whether it is online or in the traditional way, unless teachers change their mind-set regarding professional development. There must be a personal transformation. For the providers of professional development, it can be just to make profit or to show that they have produced a number of graduates in the teaching profession. Thus, there must be an overall transformation concerning teacher professional development at both teachers' and PD providers' level. In the local context, we need to change teachers' perceptions about the MIE. This could be done through trainers' training and a rebranding of the institution. This could add more value to the programmes offered. A complete rebranding must be carried out to change teachers' views about the institution, even though the MIE has become a certification institution since 2017. Even though the MIE has started to offer some courses in blended mode, the main issue is how to reduce the inconsistency between the positive reaction of teachers towards online teacher-training programs and their engagement in online teacher training.

The way professional development is being offered to teachers now needs to be changed. Teachers need to feel that these programmes are helping them to improve their daily work. As teachers tend to teach the way they have been taught, if the current teachers change in the way they interact with professional development to being mostly online delivery, this would undoubtedly influence future teachers' beliefs. Therefore, pre-service training needs to be provided to aspirant teachers; such training must enable these aspirant teachers to understand and change their traditional pedagogical beliefs so that they can

develop more constructivist pedagogical beliefs. Most of the practising teachers in secondary schools lack pre-service training which could have enabled them to acquire pedagogical skills. Their traditional teacher-centred practices emphasis on the transfer of knowledge and skills in only one direction – from teachers to students. This way of teaching is compatible with the educational system which is examination oriented and depends mainly on memorisation. Moreover, the teachers have a predefined syllabus which needs to be covered within a time limit. Even though teachers get pedagogical training through in-service training, their teaching remains the same as the system in which they interact remain unchanged.

8.2.4 A model to predict secondary school teachers' online teacher-training usage as professional development

In trying to answer the question as to why secondary school teachers had such beliefs about online professional development, the data revealed that secondary school teachers largely share the reasons regarding their beliefs about online professional development. This is because teachers' knowledge and beliefs about pedagogy and learning online are connected. Teachers use both knowledge and beliefs to decide whether to use OPD programmes. It is clear that they underestimate their efficacy beliefs concerning the usage of ICT in their education compared to its usage as leisure. They believe that more effort is needed to use ICT in their own learning. Their beliefs about online professional development will not change unless their needs are met. Another factor that affects online professional development is how to authenticate students' work, in our case teachers' work, online. Teachers must be honest to themselves when submit work online, they must act as professionals. But are teachers ready to be considered as professionals?

Figure 8.1 is a model used to predict and explain how teacher beliefs about OPD influence their participation in OPD programmes. The different facilitating and inhibiting factors influence teachers' beliefs about OPD, which in turn influence their participation in OPD. Course structure and unfamiliarity can be related to the effort expectancy in the UTAUT model; theory versus practice and professional growth and progress can be related to performance expectancy and to content and activities construct in a model of teacher learning. Unexpectedly, evidence of students' performance was not regarded as an influencing factor for engaging in OPD in the qualitative study, while in the quantitative

approach, it was seen to have a negative influence on online teacher-training usage. An explanation is that most of the time the students' performance is credited to the private tutoring teachers rather than the class teachers. Teachers tend to follow professional development to get a salary increase or for future promotion rather than to improve students' performance. We can see that in the teaching profession, very few teachers will have the possibility to get a promotion. Moreover, the salary increment that teachers used to get after following professional development courses to upgrade their certificate has been removed after PRB report 2016. Thus, to get more money teachers invest their time in providing private tutoring after school hours and on weekends. This encourages isolation and competition among teachers to get more students. With OPD both activities can go hand in hand. This is in line with Mushayikwa (2013) who finds that competition encourages teachers to work in isolation. We can see that there is a need to change the current model of professional development as it is not effective because teachers' needs are not met. This confirms the findings of Seferoglu (1996), where 80% of the respondents stated that professional development provided did not meet their needs.

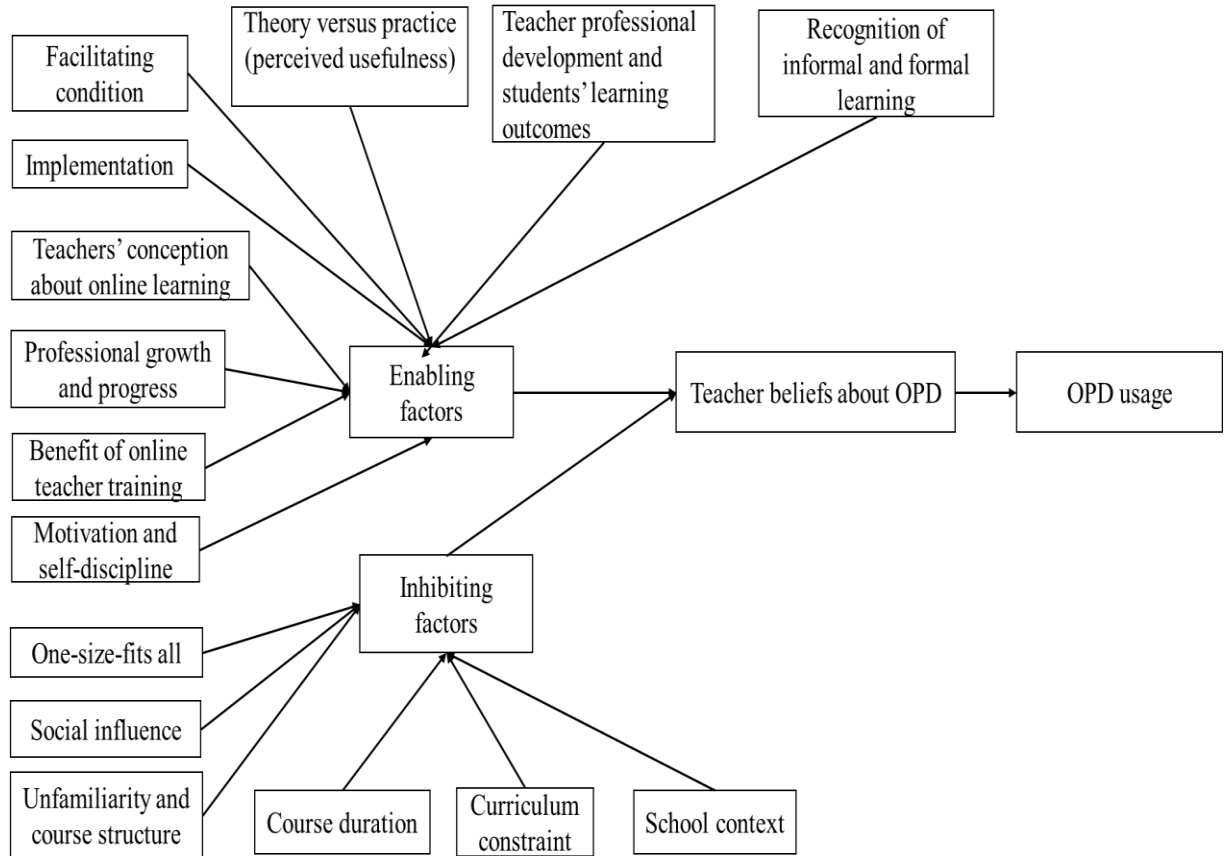


Figure 8.1: A model to predict online teacher-training usage

8.3 Implications of the research findings

This section takes us back to the critical questions stated in Chapter one and explores the degree to which these questions have been answered by this study. This research was designed to explore teachers' beliefs about the practice of the online learning in teacher professional development. In addition, an enriched model of factors that significantly influence teachers' beliefs about online professional development was created in this study. Based on the findings, a measuring instrument was constructed to measure teachers' beliefs about online professional development. The study appears to support the argument for a change in teachers' beliefs about online professional development. Teachers' personal transformation needs to occur so that they can use online professional development effectively. On the face of it, this would suggest that facilitating conditions, content and

activities, effort expectancy, evidence of student's performance and performance expectancy may be important factors in predicting online professional development usage. Therefore, teacher PD providers must consider these factors while offering OPD for teachers, more specifically, with emphasis on the content and activities of OPD, since content and activities of OPD are important predictors of use of OPD and teachers are claiming that the current PD does not meet their individual needs in addition to their students' needs. Having said that, it is obvious that one-size-fits-all PD programmes need to change to accommodate content and activities that are related to teachers' needs. Therefore, teachers must be part of the curriculum development team for teacher PD as teachers are the ones who know their own needs and their students' needs, thus enable teachers to take ownership of their own learning. Teachers need to be "active agents of their own professional growth" (Schleicher, 2012, p. 73).

Since evidence of students' performance negatively influences online teacher-training use behaviour, and that teachers prefer to invest their time in providing private tutoring, parents have to be educated, as it is the parent and/or the students who take the decision to attend private tutoring. At first private tutoring was seen as a plus for those low achievers, now it is becoming a must for every student. Parents and students believe that private tutoring is the key to success in examinations. As in other countries (Loveluck, 2012), teachers in Mauritius provide private tutoring to increase their income. Therefore, to discourage private tutoring, stakeholders can improve teachers' conditions of service such as salary increases.

Finally, being experts, teachers need to take ownership of their capability beliefs. As role models, they have the opportunities to change the system in which they evolved. They are the agents of change, they must blame themselves rather than the system which cannot change by itself. PD affects teachers personally, so teachers must change their pedagogical beliefs. Obviously, teachers must stop teaching in the way they themselves have been taught to be able to create the change they want as they have the important role of moulding the citizens of the society and the generation to come. But teachers prefer to remain in the vicious circle which lets them navigate around the system and keep on teaching the way they have been taught. Consequently, they continue waiting for the system to change and focusing on

the challenging beliefs. In that case, teachers would not grow and progress, which is the main objective of TPD.

8.4 Contribution of the research

This study makes its contribution to knowledge in several ways:

Firstly, an enhanced view of the literature of PD and online professional development of secondary school teachers has been provided. We have seen that teachers' experiences with teacher-training programmes, online teacher-training use behaviour and challenges of online teacher training were the major factors that should be used as guidelines while implementing online professional development for teachers. Moreover, facilitating conditions is an important construct for prediction of behavioural intention to use online professional development. These facilitating conditions are in terms of accessibility and availability, openness and sites. This means that teacher professional development need to be continuous and embedded in teachers' daily work, while promoting collaboration at the same time. Consequently, the content and activities of such programmes must be related to teachers' needs. Teachers must be active learners. Based on the findings, some important drivers of implementation and identified areas for advance methodological research have been identified.

Secondly, this study will make an original contribution to shaping future directions, actions and developments for teacher education and for particular specialists in the area of teacher education, more specifically online professional development for teachers. It was found that OPD content and activities were the most important predictors of online teacher-training usage in this study. Performance expectancy is no longer the strongest predictor of online professional development acceptance. Furthermore, the model can predict teachers' online training use behaviour up to 93%. But social influences are no longer a predictor of behavioural intention to use OPD. Therefore, this study provides teacher professional development practitioners and institutions with a context-appropriate model that can be used to assess the adoption or usage of online professional development programmes for teachers in Mauritius and similar countries. These have been achieved by combining the UTAUT model and teacher learning model in this study. The UTAUT model concerns the adoption of online technologies while the teacher learning model is about how teachers learn. When

combining these two we have a deeper understanding about teachers' beliefs about using online technologies for teachers' learning.

Thirdly, the findings from this mixed-methods study concerning teachers' beliefs about online professional development present a significant contribution to the body of literature in being one among the first studies of its kind to be carried out in Mauritius. From a methodological viewpoint, the two facets of this thesis which add major value to our current understanding of teacher professional development in Mauritius are firstly, in the implementation of a mixed-methods methodology and, secondly, in the demonstration of the need for larger survey research in the field of teacher professional development mostly online. The findings from this study speak directly to teachers' professional development institution providers, the participants, and the government planning educational reforms to improve teaching and learning in schools.

8.5 Limitations of the study

First, the study is limited in scope as it took place in two grant-aided Confessional schools. Future research could take into consideration state and fee-paying schools. Another limitation of the study is the sample size for factor analysis; Tabachnick and Fidell (2001) recommend 300 respondents to be good sample size. In the study the sample size was 65, which is between very poor and poor as 50 respondents are regarded as very poor and 100 as poor. For the same reason it was not possible to use AMOS to analyse the causal effect of each construct in the conceptual framework. A larger group of teachers could help to widen the scope and possibly reveal interesting comparable findings to broaden and validate the findings obtained. State secondary school teachers were intentionally excluded and the study was restricted it to Confessional secondary schools, but it could be extended to state secondary school teachers, which could enhance the findings regarding teachers' beliefs about OPD. As other factors may influence teachers' beliefs about OPD such as perspectives of state secondary school teachers, school leaders. However, these factors were beyond the scope of this study. Moreover, there is a lack of longitudinal data, as beliefs can change over time, and the study take place at a particular time, the results may change if the teachers were studied over several years. It must be stressed that this research has been primarily concerned with teachers' beliefs about online professional development and not about the current usage

of online professional development. The participants might not have engaged in any online professional development programme before the study. The analysis has concentrated on factors influencing teachers' beliefs about online professional development. Therefore, only the facilitating conditions and inhibiting factors that influenced teacher's beliefs about online professional development have been addressed. The researcher is not an expert in quantitative analysis.

8.6 Recommendation for future research

The scale of this debate is extensive and multifaceted even in the local context. To generate achievable policy strategies with regard to online teacher professional development, there is a necessity for further case studies at both the local and global level to allow further assessment of local as well as foreign dimensions of the topic. As without well-qualified teachers, schools are more likely to be just buildings and equipment. If the teaching profession does not have the same status as other professions such as law, these professions will continue to charm the best and brightest students, resulting in the shortage of well-qualified teachers. Thus, the recruited teachers may not have the best qualification. The youths will suffer, implying that the future will suffer. More research to discover new approaches to teacher professional development that transforms teachers' practices and improves students' outcomes need to be carried out. Moreover, there is a necessity to explore teachers' beliefs about professional development so that institutions can develop more effective programmes for teachers.

One avenue for further study will be to explore why the introduction of ICT in teacher professional development is lagging behind the access to ICT. Since we are living in a digital world, education must keep pace with technology. Actually, access to ICT is improving rapidly, but its integration in education seems to be still in its infancy, mostly in teacher education. Furthermore, without further research into beliefs of teachers currently using OPD, it will not be possible to understand teachers' beliefs about online professional development, resulting in an inadequate implementation of teacher online professional development programmes.

The model developed in this study can be tested with a larger and broader population and/or in other contexts, as this study has been carried in a developing country where

technology has to be imported and adapted to the local context. The sample can also be from state secondary schools, fee-paying secondary schools or combinations of the three types of secondary schools. Further research concerning the model that predict teachers' behavioural intent to use online professional development and online teacher-training usage is needed to change teachers' beliefs about OPD.

8.7 Implications for practice

While a single study cannot provide a sound basis for practice of online teacher professional development, this study would suggest the following:

1. Shift to an alternative mode of delivering PD which can offer tailor-made resources for teachers to grow and progress professionally.
2. Set up a Teachers' Council with which all teachers need to be registered as a professional, thus recognising teacher as professionals. The council will be a regulator for teachers' professional development.
3. Develop professional development standards for best practice that the providers of such programmes need to follow.
4. Ensure that each teacher follows continuous professional development programmes in a given period of time to be current and relevant. The council can offer opportunities to teachers by organising conferences where they can attend or participate in educational conferences to be aware of the latest research in the educational field. In participating in such activity, teachers will develop their leadership skills and shout their needs and do not wait until other do so.

The school policy must evolve with changes and needs of the society. Schools need to find ways of letting technology such as mobile phones be part of the school culture while at the same time regulate their use by educating the students about the consequences of technology misuse. The stakeholders must take teachers' views into consideration as they are the "expert" and know their students' needs, otherwise teachers will continue to attend PD courses just for the sake of doing them.

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APPENDICES

Appendix A: Informed consent for focus group

A study of exploration of secondary teachers' beliefs about online professional development.

Declaration

I _____ (participant's full names) hereby confirm that the nature of this document and nature of the project research was explained to me and made clear to me. I do agree to take part in the focus group and the survey.

It was also made clear to me than I can freely withdraw my contribution from the project when I desire.

I hereby provide permission to:

Audio-record my group discussion

YES NO

SIGNATURE OF PARTICIPANT

DATE

Appendix B: Participant information sheet

Participant Information Sheet

A study of exploration of secondary teachers' beliefs about online professional development.

Dear Contributor,

You are invited to join this research work as part of a study at the University of KwaZulu-Natal, in Durban (Edgewood Campus). This study will explore teachers' beliefs about online professional development and why they have such beliefs. Two issues are important: a) what factors influence secondary teachers' beliefs and b) why secondary teachers' have such beliefs about online professional development?

I will conduct focus group once with you. The duration of each focus group will be approximately 45 minutes. The focus group will be tape recorded. The anonymous of all the participants of this study will be kept at all cost. I will carefully use any information you share with me in such a way to prevent you from being identified. In order to protect your identity, you will be invited to provide a different name while participating in the focus group. You must feel free to remove your participation at any point of the research without any undesirable or unwanted consequences. All information shared will be only used for research purposes. All tape recorded data, including the transcripts, will be safely stored in a locked cabinet.

Authorization to carry out this research study was granted from the University of KwaZulu-Natal.

This project is supervised by Prof. Irene Govender from the University of KwaZulu-Natal, School of Education; email Govenderi4@ukzn.ac.za or phone 0312603485. If you have further queries regarding your involvement and your rights in this research you can contact Ms Phume Ximba of UKZN Humanities and Social Sciences Research Ethics Committee at ximbap@ukzn.ac.za or call her at 27 31 2603587.

Thank you for your cooperation.

Jianey Flore

23057794035

jianeyf@yahoo.com

Appendix C: Participant information sheet

Participant Information Sheet

A study of exploration of secondary teachers' beliefs about online professional development.

Dear Participant,

You are invited to join in a research study as part of a study at the University of KwaZulu-Natal, in Durban (Edgewood Campus). This study will explore teachers' beliefs about online professional development and why they have such beliefs. Two issues are important: a) what factors influence secondary teachers' beliefs and b) why secondary teachers' have such beliefs about online professional development?

I will provide you with a questionnaire. The duration for completing the questionnaire will be approximately 20 minutes. Every effort will be made to guarantee that no one will know that you contributed in this study. If any information that you share with me is used, I will be cautious to use it in a manner that no one will be able to recognise you. You will be asked not to write your name on the questionnaire so as to protect your identity. You are free to withdraw from the research at any stage without negative or undesirable consequences. All information is only intended for the research purposes. The questionnaires containing all the collected data will be stored in a locked cabinet.

The University of KwaZulu-Natal has given permission to conduct this research study.

This project is supervised by Prof Irene Govender from the University of KwaZulu-Natal, School of Education; email govenderi4@ukzn.ac.za or phone 0312603485. Ms Phume Ximba of UKZN Humanities and Social Sciences Research Ethics Committee can be contacted at ximbap@ukzn.ac.za or call her at 27 31 2603587, if you have any queries about your involvement and your rights in the study.

Thank you for your cooperation.

Jianey Flore

23057794035

jianeyf@yahoo.com

Appendix D: Tool for phase one (FG)

Table 1: Tool for focus group

Number	Question	Justifications
General information about Traditional PD		
1	What is teacher professional development?	To know how teachers see or define professional development.
2	What do you think as a teacher about traditional professional (face-to-face) development?	To see whether teachers feel that traditional PD is relevant or useful for them.
3	What aspects of traditional TPD do you value or find useful?	To see whether some aspects of traditional PD are relevant or useful for them.
4	Do you think that professional development should be compulsory throughout teachers' lives? Talk about your experiences with PD	To know whether they that PD should be ongoing. To know their experiences with PD
5	To what extent do PD content change your practices, knowledge and confidence in PD courses?	To know whether PD content has changed their practices, knowledge and confidence in PD courses.
5	Do you think you need another type of professional development program?	To know whether they think that another type of PD will help them more.
General information about Online Professional Development		
6	What is online professional development for you?	To know how teachers see or define online professional development.
5	What are your views or opinions about online professional development programs for teachers?	To see teachers' views and opinions about online PD, whether they see OPD as been relevant or useful to them.
7	Have you come across online professional development courses or programs?	To know whether teachers have come across OPD
8	What do you think about OPD program?	Know their knowledge about technology
Teachers' views about OPD		
9	Do you think that you can engage in an OPD program in the future if it is available? Why?	To know how their beliefs are constructed
10	What factors do you think will be needed if you are to engage in an OPD program?	To know about context beliefs and factors that can influence their beliefs
11	Do you think that special skill/s is/are needed to participate in an online professional development	To know their self-efficacy and capacity beliefs (effort

12	What do you think about a TPD program which is available at your convenience?	To know what teachers think about OPD
13	If you are to engage in a TPD program and you have a choice between online PD and face-to-face PD. What will you prefer? why	To know whether teachers prefer online PD to face-to-face PD.
Factors influencing teacher beliefs		
14	To what extent do you have access and use computers and internet i) at home ii) at school?	For their Context beliefs and about access to technology
15	What do you think about online PD brings more collaboration among teachers?	To know how teachers see collaboration among teachers
16	Do you think that collaborating with others can enhance your teaching and learning?	Whether they beliefs that collaboration can improve their work.
17	What do you think about a professional development program where you can choose your learning experiences, time schedule and place?	To see whether they think that online learning will be more appropriate for them.
18	Does the school value PD? Does the Ministry of Education encourage PD? How?	To know whether the school's policies value PD.
19	What do you think about the duration of professional development programs? Should PD be on-going?	To know if they value on-going PD or one-shot workshop.
20	What contexts are likely to be most conducive for teachers' professional learning?	To know they think that the context is important for them. Whether they like work-based learning, away from the workplace or it depends on the learning activities.

General information about traditional PD	
1	What is traditional professional development?
2	Why teachers follow PD courses according to you? (is it for certification, content,...) i) You experiences with face to face PD. Should it be ongoing ii) Are the content relevant and useful to you? iii) Do PD content change your practices, knowledge and confidence in PD courses?
General information about OPD	
3	What is teacher online professional development for you? i) your views or opinions about online professional development programs for teachers
4	Do you think PD should be organise at school level?
5	Should teachers be encourage to follow OPD according to you?
Teachers' beliefs about OPD	
6	Do you think that you can engage in an OPD program in the future if it is available? Why? i) What do you think about a TPD program which is available at your convenience?
7	Do you think OPD will be more adequate for you? In term of i) Relevancy ii) Content iii) Time schedule iv) Availability v) Medium of delivery

Factors influencing teacher beliefs	
8	If you are to engage in OPD, what you think should be available as resources? (Internet access, skill, content, duration..)
9	i) What factors will help you to engage in OPD courses? How?
10	ii) Factors preventing you to engage in OPD courses?
11	What do you think about a professional development program where you can choose your learning experiences, time schedule and place? What is your views about collaborative learning?

Appendix E: Tool for phase two (Questionnaire)

The objective of the study is to explore the beliefs of teachers about online professional development. This questionnaire can be completed in about 25 minutes. The study specifically aims at revealing factors influencing the use of online professional development. By exploring these factors, the researcher will identify teachers' beliefs about teacher online professional development.

Thank you for participating in the survey.

PART 1: GENERAL INFORMATION

(Please tick ✓ as appropriate)

- 1) Gender M F
- 2) What is your age group?
20 - 29 30 - 39 40 - 49 50+
- 3) For how long have you been teaching?
 0 - 5 6 - 10 11 - 15 16 - 20 20+
- 4) I teach the following subject/s
English Business Social Studies
French Economics

Mathematics

Accounts

Science

Others

5) What is your **highest** qualification?

Diploma

B.Ed

First Degree

PGCE

Master

PhD

(BA, Bsc, Bcom)

6) Are you following any professional development course currently?

Yes

No

If yes, please specify

.....

7) Have you followed any professional development course during the past 5 years?

Yes

No

8) Have you followed any online professional development course in your career?

Yes

No

If yes, please specify

.....

9) I can access the internet from:

Home

School

Anywhere

10 a) How often do you access the internet? (Choose the appropriate column: Daily/Weekly/Monthly)

Daily		Weekly		Monthly	
Not at all	<input type="checkbox"/>	Not at all	<input type="checkbox"/>	Not at all	<input type="checkbox"/>
1 - 2 times	<input type="checkbox"/>	1 - 2 times	<input type="checkbox"/>	1 - 2 times	<input type="checkbox"/>
3 - 4 times	<input type="checkbox"/>	3 - 4 times	<input type="checkbox"/>	3 - 4 times	<input type="checkbox"/>
More than 5 times	<input type="checkbox"/>	More than 5 times	<input type="checkbox"/>	More than 5 times	<input type="checkbox"/>

If daily, please specify the number of hour/s: _____

b) How do you get access to the internet?

PC	Laptop	Tablet PC	Smartphone
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11) As a secondary school teacher, I regard my online learning skills as

Beginner with support Confident on my own

12) Technical support should be provided if I am engaging in an online professional development program. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

1	2	3	4	5
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Part 2: Understanding of teacher professional development

This section is about your understanding about teacher professional development. Please select the views represent best your description about teacher professional development.

- 1) Tick what best describes your view of teacher professional development. (You may tick more than one)

Training to help teachers in managing their classes.	
Helping teachers in mastering their subject	
Learning different educational theories.	
Attending workshops.	
Following educational courses.	
Attending short educational courses.	
Follow courses to learn new teaching techniques, theories and other experiences.	
In-service training.	
Life-long learning.	
Acquire teaching and pedagogical skills to improve teachers' work.	
Training related to your working context.	
Opportunities to share experiences and resources with colleagues, discuss with colleagues.	
Follow non- award online educational courses on the web.	
Follow award online educational courses on the web.	

Part 3: Beliefs of secondary school teachers towards educational system

This section measures your beliefs about the educational system. Please provide your level of agreement regarding the following statements about teacher online professional development. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	Aspirant secondary school teachers need initial teacher training.					
2.	All secondary school teachers should have had an initial teacher training program.					
3.	The trainers should be trained.					
4.	Educational reform should focus on teacher's professional development.					
5.	There should be a Teacher Educational Council to regulate teachers' licences.					
6.	Teacher professional development should be compulsory throughout my career.					
7.	All secondary schools should be managed by only one agency.					
8.	Promotion should be only in terms of seniority.					
9.	Teachers continue with spoon feeding approach despite the trainings obtained.					
10.	The spoon feeding approach promotes competition instead of cooperative learning.					
11.	For teachers to be creative and innovative, the mode of assessment must be changed.					
12.	The schools must provide opportunities for teacher professional development.					
13.	The school must allocate time slots for collaboration among teachers.					
14.	Teacher professional development should be embedded in teachers' daily practices.					
15.	Learning must be more collaborative and engaging across all learning domains (cognitive, affective and social).					
16.	Teachers should be encouraged to carry out action research project to improve the education system.					
17.	Teacher professional development should be compulsory and with salary increase.					
18.	Teacher professional development should be optional.					
19.	Teacher professional development should be optional and with salary increase.					

Part 4: Online professional development activities and content

This section measures your views about Professional development activities and content. Please provide your level of agreement regarding the following statements. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	Online courses can be an alternative to provide specific courses.					
2.	The tasks in online professional development courses can be tackled by teachers of all ages.					
3.	The content and activities in online professional development help me to improve my teaching.					
4.	The content of online professional development courses is directly related to my work.					
5.	Content in online professional development courses can be adapted to my school context.					
6.	The content and activities of online professional development courses are readily available at my workplace.					
7.	Can get access to other teachers' experiences in online professional development programs.					
8.	I can get access to foreign experiences locally through online professional development programs.					
9.	The content is continuously updated.					
10.	The content can be used again and again.					
11.	Even though teachers follow professional development courses, they continue teaching the way they used to.					
12.	Online learning environment combines practice and theory.					
13.	Teachers learn more through reflection and discussion about their own practices.					

Part 5: Facilitating factors for online professional development

This section measures your beliefs about the facilitating factors for online professional development usage. Please provide your level of agreement regarding the following statements about benefits of using online professional development. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	The school management values teacher online professional development programs.					
2.	Teachers can access resources related to their needs in online learning.					
3.	I can access resources at my ease anywhere.					
4.	I can access resources whenever needed					
5.	Time is being provided for me to access professional development courses at my workplace.					
6.	The content of the courses / programs can be adapted to the local context					
7.	The school provides facilities for me to access online professional development programs.					
8.	I have necessary resources to use the online professional development programs both at school and at home.					
9.	The ease for the user to accomplish basic tasks for the first time will encourage teachers to use online professional programs.					
10.	Specialised instructions concerning the online professional development are available to me.					
11.	Online professional development does not act as a barrier for teachers to offer private tuitions.					
12.	Professional development should be continuous and progressive.					
13.	Support is available to assist me with difficulties encounter in online professional development programs.					
14.	The trainer must be familiar with the school context					
15.	Professional development must be more demand-driven.					

Part 6: Inhibiting factors of online teacher training

This section measures your beliefs about inhibiting factors of online teacher training programs. Please provide your level of agreement regarding the following statements about the challenges of online teacher training facilities. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	Teachers will participate in online professional development courses of recognised institutions.					
2.	The courses must be well-structured for teachers to participate in online professional development programs.					
3.	The limitation of ICT infrastructure is seen as inhibiting the rate of use of online professional development programs.					
4.	The participants need self-discipline to be able to participate in online professional development programs.					
5.	Participants can have health problem while using ICT devices for a long period of time.					
6.	Privacy and security need to be provided to increase teachers' trustworthiness in online professional development programs.					
7.	Lack of trust in online professional development courses due to plagiarism.					
8.	As teachers are used to the old system (face-to-face), it will be difficult to move to the new system (online).					
9.	If there are no incentives such as salary increase/promotion possibilities, teachers will not participate in online professional development programs.					
10.	Imposing a one-size-fits all teaching and learning approach will likely lead to frustration and discontent.					
11.	The unfamiliarity with the internet convention (eg how to download or upload a task) causes a refractive action towards online courses.					
12.	Professional development curriculum should be adjusted according the teachers' range of behaviours and beliefs.					
13.	Teachers engage in professional development programs for certification to obtain promotion or salary increase.					

1.	Informal learning should be recognised as a means for long-life learning.					
2.	More learning take place through informal learning rather than through formal learning.					
3.	Online professional development should be recognised.					
4.	Teachers should be rewarded after completing a professional development course.					
5.	Promotion is very limited in the secondary sector.					
6.	If there is promotion, it should depend on competency rather than seniority.					

Part 7: Performance expectancy

This section measures your beliefs about performance expectancy as regards online professional development. Please provide your level of agreement regarding the following statements. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	Online professional development resources promote creativity and innovative.					
2.	Online professional development courses allow me to network with other teachers.					
3.	Online professional development programs make it easy for me to find resources for my teaching.					
4.	Experienced teachers do not use ICT tool in their classrooms.					
5.	I can view online videos of other teachers to improve my practices.					
6.	I have access to other teachers more readily.					
7.	Online learners must be autonomous and interactive, self-motivation and self-discipline, and have a high level of integrity.					
8.	Online professional development programs help teachers to improve their teaching.					
9.	The more teachers perceive that online professional development programs have improved their work, they will be more likely to use them.					

1.	Teachers' beliefs about online professional development programs and its potential to facilitate their professional learning are more likely to influence teachers' decision to use online professional development facilities.					
2.	Professional development which is more directly related to teachers' needs will more likely to improve their daily work.					
3.	Online professional development program enables me to be confident in performing my teaching.					
4.	With online professional development programs, I am able to collaborate with others to improve my teaching.					

Part 8: Teachers' experiences with teacher training courses

This section measures your beliefs about teachers' experiences with teacher training courses as regards to theories and practices. Please provide your level of agreement regarding the following statements. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	Professional development courses are too theoretical.					
2.	The content of professional development courses changes the teaching practices of teachers.					
3.	The content of professional development courses is not related to the school context.					
4.	The content of professional development courses does not meet teachers' needs.					
5.	The professional development activities help me to grow professionally.					
6.	Professional development of teachers should focus on "how to teach" that is the practical aspect.					
7.	Teachers need to perceive the usefulness of teacher training courses to benefit from them.					
8.	Teachers acquire pedagogical content knowledge after following online teacher training courses.					
9.	Short courses are more effective for teachers.					
10.	Intensive and lengthy professional development courses have more impact on teaching practices.					

1.	Intensive and lengthy professional development courses have more impact on teaching practices.					
2.	One-size-fit-all teacher training courses are not adequate for the school advancement.					
3.	One-size-fit-all teacher training courses does not meet teacher's needs.					
4.	Teachers prefer to invest their time in private tuitions or other activities rather than attending professional development courses.					
5.	The way I teach is influenced by my experiences since I was student.					
6.	If the course or program is not complex, teachers will more apt to use it.					
7.	My experiences as student influence the way I teach.					
8.	Online learning caters for all learning styles.					
9.	I can express myself freely in online professional development courses.					
10.	Online learning has removed the factor of time and space.					

Part 9: Social factor

This section measures your beliefs about social factor as regards online professional development. Please provide your level of agreement regarding the following statements. (1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = disagree, 5 = Strongly Disagree)

		1	2	3	4	5
1.	People in the school who use online professional development have more prestige than those who do not.					
2.	The school management encourages me to participate in online professional development programs.					
3.	In online learning environment it is more about digital presence rather than human contact.					
4.	Teachers tend to work in isolation.					
5.	I use the online professional development because of the proportion of teachers who use the system					
6.	Teachers have difficulties to collaborate with colleagues within the schools and in other schools.					

1.	People in the teaching field who use online professional development have a high profile.					
2.	Using online professional development programs is a status in the school.					
3.	People who are important to me think I should use online professional development programs.					
4.	I can share experiences and resources with teachers within the school and with teachers in other schools with online professional development.					

Appendix F: Data collection plan

Table 1: show how I get the purposive sample.

Experiences (years)	Gender		Qualification				Subject			
	M	F	Master	PGCE	B. ED	Bachelor	Mathematics and Science	Economics side	French	English
0 - 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 - 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 - 8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 - 11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12+	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DATA COLLECTION PLAN

Table 2: Table showing the objectives and why the data is needed.

Objectives	What data do I need?	How can I get the data?
Understand teachers' beliefs in OPD.	Teachers' views about OPD in term of awareness.	Using focus groups and questionnaire.
Analyse why teachers have such beliefs in OPD.	Teachers' views and why such views. (in term of relevancy, content and context)	Analysing the interactions of the participants in focus groups and results from questionnaire.
Explore the facilitating and inhibiting factors that influence secondary teachers' beliefs.	Facilitating and inhibiting factors that influence secondary teachers' beliefs about OPD.	Focus groups and questionnaire.

Mixed methods – exploratory sequential design

Table 3: Data collection plan

Phase	Critical Questions	Sources of Data	How many Participants	Instruments	Timeline	Remarks
1. To collect data about teachers' beliefs about OPD from different perspectives	<p>1. What are the secondary school teachers' beliefs about OPD?</p> <p>2. To what extent the existing factor influence secondary school teachers'</p>	<p>Confessional Secondary school teachers with working experiences one year upward.</p>	<p>5 participants one from each group of working experiences; 0-2; 3-5; 6-8; 9-11 and 12+.</p>	Pilot teacher focus group	<p>January 2015</p> <p>Pilot focus group discussion.</p> <p>Change the question accordingly</p>	<p>The 5 categories of participants are selected to provide understandings about beliefs about OPD from different perspectives.</p>

	beliefs about OPD.					
--	-----------------------	--	--	--	--	--

<p>2. Analysis data from focus group</p>	<p>The result will yield the main question for the 3 focus groups.</p>					<p>This analysis will provide results that will be used to design a questionnaire to collection data in phase 2.</p>
<p>3. to get deeper insight into participants' understanding of their beliefs about OPD</p>	<p>1 . What are the secondary school teachers' beliefs about OPD?</p>	<p>Purposive selection of a 'best' sample of teachers</p>	<p>15 participants divided into three groups (5 participants in each group)</p>	<p>3 Focus group discussions – audio recorded</p>	<p>Februar y 2015</p>	<p>Why they say what they said about what they do?</p>

	<p>2. To what extent the existing factor influence secondary school teachers' beliefs about OPD.</p> <p>3. How are secondary school teachers' beliefs about OPD constructed and enabled?</p> <p>4. Why do</p>					
--	---	--	--	--	--	--

	secondary school teachers have such beliefs about OPD?					
Generalisation		Secondary school teachers	5 participants	Piloting questionnaire		
Same		Secondary schools teachers	75 participants	questionnaire		
4. Level 1 Analysis	Crossing the result from phase 1 with phase 2				March 2015	
Level 2 analysis						
5. Level 3 Analysis	4. How are teachers' beliefs are constructed and enabled?	Meta analysis across all data – theorising			April 2015	Interpreting the nature beliefs about OPD using Conceptual Framework.

	5. Why do secondary school teachers have such beliefs about OPD?			Going back to selected participants if needed.
--	--	--	--	---

Appendix H: Coding focus group discussion

Participants' definition of PD

It is a way to improve, acquire knowledge, skill, strategies that teachers can apply in their context.

Teachers get access to facilities to develop, get knowledge to master their subject matter.

It is a way for teachers to be up-to-date.

It is training for teachers.

Lifelong learning or ongoing learning.

It is professional growth.

Class management.

Class management.

Traditional PD

It happens within a class using books, board and markers.

Happens in face-to-face mode.

It is a general course, not specific.

The teacher, tutor or trainer is the delivery of knowledge (teacher-centred approach).

Experiences with traditional PD

The content is not related to the school context.

Seen we have being raised in this mode of delivery, so no need to adapt to new ways of learning.

Trainer/tutor do not know the school context to address the issues.

Courses tend to be boring.

Have to attend courses after working hours, so cannot concentrate for long hours.

Problems with traditional PD

Too theory centred, and theory cannot be apply directly as it does not reflect or match the school reality.

Lack of resources

Develop only cognitive thinking.

Difficult to apply in the context.

There is almost no choice, have to go through this mode.

Benefits of traditional PD

Help to think about situations

Is used to traditional mode of knowledge delivery, therefore no need to learn new way of learning.

Participants can choose part of the context that are useful.

Practical sessions can be integration in the course.

The educational system favour traditional approach, as students will have to take written examinations.

Online professional development

Online learning, virtual.

Learning in digital world.

Self-development learning.

Why will engage in OPD in the future

To get experience

Can access foreign courses locally.

No need to travel, can learn at home.

As we are living in a digital world, have to learn through technologies.

Will engage in short duration course.

Depending on the content, whether the content is useful or not.

Benefits of OPD

Available 24 hours

No need to wait a long time before obtaining a seat; can be done at any time.

Can access resources in a relax mode.

Can better manage family and study time.

Can enrol when you feel the need.
No need to travel, therefore save time.
Can engage in forum discussion anonymously.
Can get access to foreign experiences.

Problem with OPD

Self-discipline is needed.
No human interactions.
Need to develop new culture, skill of learning.
Can get health problem while using computer for long hours.
Not real practical sessions.
Have to trust the source of information.

Factors needed to encourage engagement in OPD

Computer skills, internet skills.
Self-discipline, motivated.
Broadband internet connections.
Beliefs about online learning.
New teachers tend to follow online courses.
Adequate infrastructure.
Useful content.

Factors which may prevent teachers' engagement in OPD

Content not appropriate.
Peer pressure, friends told not to follow online courses.
Courses are boring.
Recognition of courses or institution.

Table 4: Difference between traditional and online PD

Traditional professional development	Online professional development
<ol style="list-style-type: none"> 1. Help to think about situations 2. Is used to traditional mode of knowledge delivery, therefore no need to learn new way of learning. 3. Participants can choose part of the context that are useful. 4. Practical sessions can be integration in the course. 5. The educational system favour traditional approach, as students will have to take written examinations. 	<ol style="list-style-type: none"> 1. Available 24 hours. 2. No need to wait a long time before obtaining a seat; can be done at any time. 3. Can access resources in a relax mode. 4. Can better manage family and study time. 5. Can enrol when you feel the need. 6. No need to travel, therefore save time. 7. Can engage in forum discussion anonymously. 8. Can get access to foreign experiences.

Table 5: Core categories and subcategories that emerged from the data analysis

Core categories	Subcategories
Technological factors	Compatibility
	Cost effective
	Complexity Benefits of online PD Available 24 hours/ 7 days. No need to wait a long time before obtaining a seat; can be done at any time. Can access resources in a relax mode. Can better manage family and study time. Can enrol when you feel the need. No need to travel, therefore save time. Can engage in forum discussion anonymously. Can get access to foreign experiences.
	Performance expectancy (perceived usefulness of OPD)
	Effort of expectancy (perceived ease of use of OPD)
	Perceived richness of OPD Facilitating conditions Social influence
Educational factors	Integrate practical sessions
	Develop only cognitive thinking
	Use to traditional mode
	General course
	Theoretical centred
	Cannot concentrate for long hours
	Boring
	Class management
	Professional growth Lifelong learning Acquire knowledge, skills and strategies Be updated
Contextual factors	Difficult to apply in school context
	With a class
	Trainer/tutor does not know the context
	Experiences
Resources	Broadband connection
	Computer system
	Computer skills
	Support
	Financial issues

Factor influencing the use of OPD	Recognition of courses or institutions
	Course structure not well define
	Limitation of infrastructure
	Limitation of personal contact
	Need self-discipline (motivation)
	Health problems
	Trustworthiness
	Has to develop new culture of learning (New trends in education)
	Habits (use to old system that is are used to book, black board and chalk)
	Beliefs
	Praise
	Social factors (peer pressure)
Context	

Table 6: Propositions that emerged from data analysis.

Core categories	Subcategories	Propositions
Technological factors	Compatibility	The compatibility of online professional development with teachers' beliefs, skills and IT infrastructure influence the use of OPD.
	Cost effective	The setup cost can be high but in the long run, it is cost effective.
	Complexity	The complexity of OPD inhibits the rate of use.
	Benefits of online PD	The greater teachers perceived the benefits of OPD, the more they are likely to use it.
	Performance expectancy (perceived usefulness of OPD)	The greater teachers perceived that OPD improve their work, they are likely to use it.
	Effort of expectancy (perceived ease of use of OPD)	If teachers find OPD is to use, therefore they will more like to use it. If less effort is needed to use, then they will use it.
	Perceived richness of OPD	Teachers' beliefs about OPD and its potential to facilitate professional learnings is more likely to influence teachers' decision to use OPD
	Facilitating conditions	If teachers see that support is being provided whenever need, they are more likely to make use of it.
	Social influence	Not support from peers or rector
Educational factors	Integrate practical sessions	
	Develop only cognitive thinking	
	Use to traditional mode	
	General course	Courses need to be more specific to the school context
	Theoretical centred	
	Cannot concentrate for long hours	
	Boring	
	Class management	
	Professional growth	
	Lifelong learning	
	Acquire knowledge, skills and strategies	
	Be updated	
	Students' background.	Students have different problems (family, economic....)

Contextual factors	Difficult to apply in school context	
	With a class (each classroom situation is different)	
	Trainer/tutor does not know the context	
	Experiences	
	Management does not encourage professional development	
Resources	Broadband connection	
	Computer system	
	Computer skills	
	Support	
	Financial issues	
Barriers to the use of OPD	Recognition of courses or institutions	The recognition of courses and institutions impact in the participation in OPD.
	Course structure not well define	The courses must be well-define for teachers to participant.
	Limitation of infrastructure	The limitation of OPD infrastructure is seen as inhibiting the rate of use of OPD.
	Limitation of personal contact	The limitation of personal contact is seen as inhibiting the use of OPD.
	Need self-discipline (motivation)	The participants need self-discipline to be able to participant in OPD.
	Health problems	ICT will impact on participant when they used OPD for long period of time.
	Trustworthiness	
	Has to develop new culture of learning (New trends in education)	
	Habits (use to old system that is are used to book, black board and chalk)	
	Beliefs	
	Praise	Praise influence the decision in participating in PD programs.

Appendix I: Matrix table showing how Qualitative and Quantitative approach are related

Table 7: Teachers' experiences with teacher training programmes

Qualitative findings	Quantitative approach		
Sub-themes	Survey question		Notes
	Part	Number	
Theory versus practices	3	1,9, 10, 11	Rate how teachers view the content of PD courses with regard to its application in their context.
	4	1, 12	
	8	1, 2	
One-size-fits all	6	10	Rate whether the one-size-fits all course content meets teachers' needs.
	8	4, 11, 12	
Course duration	8	9, 10	The length of the course which teachers view as more effective.
Professional growth and progress	8	5, 6, 7, 8	Rate how teachers see PD content regarding their professional growth and progress.
Teacher PD and student learning outcomes	4	3, 4, 5	Rate whether teachers see PD as a positive influence on student learning.
	8	13, 16	
Social influence	3	15	Rate how social factors can construct or enable teacher's beliefs about OPD.
	5	1	
	9	1, 2, 3, 5, 6, 7, 8, 9, 10	
School context	3	12, 13	

	8	3	Rate whether the school is promoting teacher PD.
	9	4	

Table 8: Online teacher training usage

Qualitative findings	Quantitative approach		
Sub-themes	Survey question		Note
	Part	Number	
Teacher conception about online learning	8	17, 18, 19	Rate how teachers construct their understanding about OPD.
	2		
Motivation	3	16, 17, 19	Rate the factors that influence teachers' motivation with regard to OPD.
	4	6	
	5	11	
	6	1, 9, 13, 17, 18, 19	
	8	7, 13, 16	
Benefits of online teacher training	4	1, 4, 5, 6, 7, 8, 10, 12	Rate how teachers see the benefits of OPD.
	5	2	
Facilitating conditions	3	17	Rate the conditions that facilitate teachers' using of OPD.
	4	2, 4, 5, 6, 7, 8, 9	
	5	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15	

Table 9: Challenges of online teacher training

Qualitative findings	Quantitative approach	
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Sub-themes	Survey question		Note
	Part	Number	
Implementation	3	1, 3, 4, 5, 6, 7, 8, 14, 15, 17, 18, 19	Rate how OPD should be implement to encourage teachers to engage in OPD.
	5	14	
	6	3	
	8	14	
Formal and informal learning	4	13	Rate the teachers' view about formal learning as well as informal learning as online learning favour informal learning.
	6	14,15, 16	
Course structure	5	9, 10, 12, 13	Rate how the course structure influence teachers' adoption of OPD.
	6	2	
	8	15	
Unfamiliar	6	8, 11	Rate how unfamiliarity with OPD can be a barrier.
Human contact	6	8	To see how teachers rate the Importance of human contact in their learning.
	9	3	
Health problem	6	5	Rate whether teachers view health problem as a barrier of using OPD.
Self-discipline	6	4	Being an important factor in online
	4	6,7, 8,13	

			learning, we want to see how teacher rate self-discipline.
Trustworthiness and security	6	6, 7	Rate how trustworthiness and security impact on teachers' adoption of OPD.
Curriculum constraint	5	15	Rate how constraint of the curriculum impact on teacher learning.
	6	12	

Appendix J Extract of data from focus group

2		FG3/07/05/15. The focus group discussions consist of five participants, P31, P32, P33, P34 and P35. The names present in the discussion are pseudonyms. P31 is participant 1 in focus group 3.				
3			Codes	Concepts	Categories	Themes
4	R	ok mo komense, premye keston, premye keston, pou zot ki veu dir developman profesional enn profeser? Okay I start, first question, first question for you what is the meaning of teacher professional development?				
5	P31	ki koumsa sa pou deroule la. This is how this will going on.				
6	R	zot pa la pou rann mwa repons hein sa veu zot dir enn zafer 1 lot dimoun fer couma dir mo pa la, pe zis poz keston. You are not here to give answer, this means you say something, another person add something else, make as if I not here.				
7	P32	developman profesional tu as dit bein comme ci developmen profesional, premyerement il dois connaitre le sujet qu'il va enseigner et puis class management heu comme ci heu je pense aussi life long learning comme ci, lor sur le sujet qu'on enseigne et aussi au niveau class management. professional development, you have said well as if professional development, firstly you must know the subject which you will teach and then class management heu as if I think also lifelong learning as if, on th subject that you will teach and also base on class management.	PD ce'est connaitre le sujet, class management, life long learning . Professional development it is knowing the subject, class management, lifelong learning.	life long learning, knowledge (subject matter and strategies)		subject mastery, life long learning, class management, PD

8	<p>P33</p> <p>seki mo pe kompran developman profesional dimoun la bizin pe travay, bizin profeser veu dir developman se apartir so profesorat so travay ki li fer developman kouma dir ki kapav ena dir ki li bizin pou ameliorer , parski li deza profeser li se pa ena developmen pou vinn profeser developman en plis detre profeser. what I understand professional development the person need to be working, need teacher meaning development it when he/she start work as teacher, his/her work that make he/she developed, that can have, she/he needs to improve (progress), because he/she is already a teacher, it is not a development to become a teacher, development above of being a teacher.</p>	<p>developman dan servis, ameliorer, en plis. In-service development, improvement, a plus.</p>	<p>in-service training, improve, get more knowledge</p>	<p>(improving teaching and learning) teaching and pedagogical skill, life long learnig (in-service training), improving classroom environment,</p>	<p>growth and progress, in-service training</p>
9	<p>P31</p> <p>promotion</p>	<p>promotion</p>			
	<p>surtout moi je pense, comme ci continuer a rester informer, parcequ'il y a beaucoup de chose qui change par exemple meme la technologie tout sa cest vraie le "class management" tout sa, c'est pas evident ...comme sheila dit mais aussi rester informer tout le temps, essayer de suivre des cours comme ci continuer a apprendre de rester "updated", comme ci avec tous ceux qui passe comme ci. Above all, me, I think, as if continue keeping inform, because there is a lot of thing which change for example even the technology, all these, it is true the class management all of this, it is not evident...as Sheila said but also keep inform all the time, try to follow some courses as if continue to learn to</p>	<p>parcequ'il y a des chose qui change (technologie, class management), rester informer tout le temps, rester updated. Because there are things which change (class management, technology), keep</p>	<p>updated, knowledge about teaching and</p>	<p>updated teaching and</p>	<p>pedagogical skills, life long learning,</p>

P33	mo pense Devlopman se ninport, konne ki materiel ki kapav ena, anplis so konesans ki li ena, ki pou kapav ed li dan transmisyon bann done a bann zeleve. I think development is anything, know what material that can have, above his/her knowledge that he/she has, that will help him/her in transmitting of content to the students.	materiel ki ena ek konesans ed profeser pou transmèt done a bann zeleve. Material which is available and knowledge help teachers to transmit content to students.	knowledge and tools	all teacher need to transmit knowledge	knowledge transmission
P31	repoz to kestion. Ask your question again.				
R	devlopman profesyonel. Professional development.				
P31	non poz kestion lamem poz kestion lamem mem si li an angle parski. No, ask the same question, ask the same question although it is in english because.				
R	What is teacher professional development?				
P31	mem..even...				
P35	kwa. What				
R	teacher professional development.				
P33	to kapav poz li en francais osi. You can ask this in french also.				
P31	sa veu dir ki profeser la li pe, li pe gagn "self-satisfaction" dan so travay, kouma dir li p, li here ladan, la dan li pe devlop sur le plan profesyonel...That means that the teacher is, is getting self-satisfaction in his/her work, as if he/she is, she/he is happy in, in there she/he is developing on the professional proud.	gagn self-satisfaction, li here, p devlope. Have self-satisfaction, happy. is developping.		grow nrofessionallv	self-satisfaction, growth and progress
P33	li pe deman twa profesyonel la. He is asking you about professional here.				
P35	satisfaksion non. Satisfaction no.		satisfaksion. Satisfaction.		satisfaction
P34	moi je pense comme j'avais dit c'est de rester informé, d'avoir des differents strategies comme ci pour devenir professionnel et d'avoir des strategies et comme ci pouvoir, savoir lequel peut mieux fonctionner dans quel contexte comme ci au depart on est un peu donc on va essayer l peu comme ci voir comme ci comment sa peut fonctionner donc eventuellement je pense que quelqu'un devient plus professionnel exactement dans quel context heu son teaching comme ci peut avoir plus d'impact et dans un autre context comme ci comment il peut shifter et gongler avec tous les strategies qu'il a. Me, I think as I said, it is to keep inform (updated), have different strategies as if to become more professional and have strategies and as if to be able to know which can be more useful, in what context as if. at start we are a little bit... so we are going to try a little as if, see as if how this can function so, eventually I think that someone become more professional. Exactly in what context heu your teaching can have more impact as if and in another context how he/she can shift and juggle with all the strategies that he or she has.	rester informé, avoir des strategies, devenir professionnel, savoir quel strategie fonctionne dans kel context. Keep inform, have the strategies, become professional, know which strategy fonction in what context.	updated, knowledge about teaching and learning, know in which context to apply which strategy, shifted strategies, professionalism	teaching and pegagogical skill, life long learnig (in-service training), contextualis the knowledge and strategies	professionalism, updated, self-reflective
P32	kan to dir sa mwa aussi je pense comme ci professional development, motivation, satisfaksion personel. When you say this, me also, I think as if professional development, motivation, personal satisfaksion.	motivation, satisfaksion			personal satisfaksion, motivation
P31	Comme ci pour etre, development profesyonel, tu grandis dans ce que tu fais donc tu grandis tu es heureux. As if to be, professional development, you grow in what you are doing, so you grow, you are happy.	grandis, heureux. Grow, happy.			growth and happiness
	satisfaksion non, personal satisfaksion. Satisfaction no, personal	satisfaksion,		motivated, satisfaksion,	personal

P31	wi to gagn enn sertenn fierte,enn enn sa peut etre o nivo training, o nivo promotion qui to gagnie se enn developman. Yes you are proud of oneself (satisfaction), one one this can be training based, promotion based, what you is development.	gagn fierte o nivo training, promotion, proud		motivated,satisfaction, improvement	promotion, training, development, satisfaction
R	aster mo azout enn ti fakter dan nou azout traditionnel ladan dir ki pou zot ki veu dir enn profeser gagn so developman profesional dan sistem tradisional. Now, I add another small factor (term), we add traditional in it, tell, for you what it means a teacher get his/her professional development in traditional system?				
P32					
P31	system la c'est quoi sa? What is sytem?				
P33	system	system			
P31	define system				
R	sistem kouma dir linn gagn kour la developman ameliorer la dan enn fason tradisional ki sa veu dir pou zot. System as if get the development course to improve in a traditional way, what does that mean for you?				
P32	tradisionel se asiz lor 1 ban liniversite. Traditional is sitting on university bench.	asiz lor ban liniversite. Sit on university bench.	asize apran kouma zelev. Sit and learn as students.		passive learning
P33	parey kouma bann zelev la. Same as the students.	kouma zelev. As students			teacher centred
P35	apran travay. Learn to work.	apran travay. Learn to work	apran travay. Learn to work		grow and progress, develop as
P32	comme ci, approche livre. As if, book approach.	livre. Book			

P34	livre, tableau non. Book, board no	livre, tableau. Book, board			passive learning traditional way of knowledge transmission
P32	ou bien tableau, la craieor. board, chalk	tableau, la craie. Board chalk	livre, tableau, la craie. Book, board, chalk	transmission of knowledge	
P34	ou l'enfant n'a pas grande chose à dire non plus, comme ci c'est sa la c'est cequ'on a connu a l'epoque. Where the child did not have much to say, as if, it is this, it is what we have known before.	l'enfant n'a pas grand chose a dire, on a connu a l'epoque. The child did not have much to say, as we have known	centre sur le prof, comme on a connu		passive learning, personal experiences
P32	c'est pas student centred comme ci, c'est plus profeser la dir, koze, lecture. It is not student-centred as if, it is more like the teacher say, talk, lecture.	pas student-centred, profeser dir, koze, lecture. Not student-centred, teacher say,		teacher-centred, teacher has the knowledge, as we are used to	teacher centred (teacher has the knowledge)
P34	c'est le prof qui a la connaissance, c'est traditionnel. It is the teacher who has the knowledge	le prof a la connaissance. The teacher has the			
P33	ban plaseman, eski kapav konsider li kouma tradisional, placement quand to pe fer kour MIE par ekzamp to bizin al travay, fer to prev kouma dir mo pa konne komie temp sa existe sistem la si kapav konsider sa kour tradisional parski finalman tradisional se pa zis teorik ena enn parti pratik osi. The placement,can it be considered as traditional, placement when you courses at MIE for example you have to go work, work to have experiences as if, I do not know how many time this system exist, if can consider traditional courses because finally traditional is not only theories, have also practical.	ena plaseman, fer to prev, se pa zis teorik ena pratik osi. Have placement, it not only theory but also practical.	teaching practice	application of theory	
P32	sa c'est pa pa mal comme ci, unaudible. This is not too bad as if.				
P33	c'est important, c'est important. It is important, it is important.	Practical is important.		emphasis on practical	theories and practical
P32	parceque tu as besoin de vivre ce que tu as fais, dan ton experience, ce que tu as appris dans les livres, en theorie. Because you need to live what you are doing, in your experience, what you have learnt in books, in theories.	mettre en pratique les theories. Live what you do, put in practice the theories.		application of theory	apply what you learned

P33	an teori. pe donn dewwar pe fer assignment, mem ozourdwi kan pe swiv kour kom kour nou ti swiv koma sapel deza teacher's licence. In theory. Is given exercises, is doing assignment, even today when are following courses, like course, we will follow like how does it name already teachers' licence.	dewwar, assignment, tradisionel ek anlin. Exercises, assignment, traditional and online.	traditional and blended mode		way of learning has changed. Blended learning
P34	ah oui. Oh yes.				aknowledgement
P33	to al asize. You go and sit.	al asize			has to move, passive learning in traditional part
P32	truk online parwa li pa striktire. Online sometimes it is not structured.	anlin pa stiktire. Online not structured.	kompar tradision avek anlin. Comparing traditional with online	problem with online course	stucture of online learning
P33	oui voila voila, d'ailleur ler, enn parti, diskusion online. Yes here is here is, by the way, one part, discuss sion online.	enn parti diskisinn online apart discussion is online	kompar tradision avek anlin. Comparing traditional with online		
P32	sa c'est.....that's it				blended learning
P34	sinon a par sa, tout est genre tu t'assois et tu ecoutes comme ci. If not beside this, everything is kind-as you sit and you listen as if. It has otherwise, all is like you sit and listen as if.	assois et ecoutes. sit and listen	teacher-centred	problem with traditional course	passive learning
R	gard ti bout online pou apre, gard li lamem so. Keep the part concerning online for later, keep it here.				

R	<p>pou zot konteni ou swa, ki zot lexpriyans avèk sa metod tradisyonèl, ki zot pe dir la, al dan klas, profèzesem li ena teaching practice dan sistèm tradisyonèl, po zot kouma dir ki zot trouve, Eski li bon bann training , bann workshop ki zot al, ninpor kouma, ki zot trouve, eski sa ed zot pou amelyore zot lenseigman ouwa ed zot pou vinn plis, senti zot pli kapav, senti zot plis self confident, ki zot pense sa bann kour la. for you content or, what is your experiences with this traditional method, which you are saying, go in class, teacher has teaching practice in traditional system, for you as if what you find, is it good the training, workshop which you go, in anyway, what you found, did that help you to improve your teaching or help you to become more, feel that you can do better, feel more self-confident, how you think about the course.</p>				
P33	<p>mo kapav comense, ofet mo pa inn siv kour ledikasyon. I can start, by the way I have not follow course in education.</p>	<p>pa in swiv kour ledikasyon. Have not follow course in education</p>		<p>see as lack of knowledge</p>	<p>pedagogical skill</p>
R	<p>non, li kapav ninpor ki kour, ki zot inn fini ou to pe swiv. No, it can be any course, that you have finished or you still following.</p>				
P3	<p>ouias, seki mo anvi dir, seki pe inport seki to kapav apran, lexpriyans ki to ensa lor terin, pa pou kapav tire, enn dimoun ki fer 2 zan PGCE par lekzanp e li fek rant travay, pa pou kapav vin dir profèzesem ki la depi 5 an, 7 an, 10 an, kouman bizin fer travay, parski li lor terin la li konne, me par kontr, definitivman li enn plis, kan mo inn al swiv kour Educators' License, ena kouma dir ban ti zafer, ena plin kitsoz mo li kone par le fe ki ena lexpriyans sur le terrain to konpran, to apran li ena plis.... definitivman, par kontr ena zenes ki fek kit lekol ti anvi fer profèzesem, mo trouy sa nesèzes. yes, what I want to say, is whatever you can learn, real experiences, cannot be removed, a person done 2 years PGCE for example and he/she is a new teacher, cannot come and say a teacher who is working for 5 years, 7 years, 10 years, how to do his/her work, because he/she is working already, he/she knows, but however, definitely it is a plus, when I had followed the Educators' license course, there are some little things, there are many things I already known as I have some experiences in teaching you understand, you learn it, it is a plus. definitely, however there are young who just left school and want to be a teacher, I found that it is necessary.</p>	<p>lexpriyans lor terin inportan, definitivman li enn plis, PGCE li definitivman inportan pou bann zenes ki fek kit lekol e anvi vin prof. Experiences in teaching important, definitely it is a plus, PGCE is definitely important for young who want to be a teacher.</p>	<p>konpar lexpriyans lor terin ek kour PGCE nivo profèzesem, linportans PGCE pou aspiran prof. Compare experiences in real context and PGCE course.</p>	<p>Importance of pre-service training, in-service training as a plus but cannot compare or replace teaching experiences</p>	<p>in-service and pre-service courses, training and teaching experiences</p>

P31	mw a mo fer kouma dir mo pa bizin al okenn par, mo rant lor internet mo gagn tou linformasion , mo apran par momem, mw a mo kontan sa fason la, mo pa kontan sa fason al assize. I do as if, I do not need to go in a specific place, I connect to the internet, I get all the information, I learn by myself, I love this way of learning, I do not like the situation where you go and sit in a class.	mo pa bizin al okenn par, lor internet gagn tou, apran par mo mem, mo kontan sa. I do not have to go anywhere, get all on internet, learn by myself, I love this.	kompar tradision avek anlign, p dir so preferans "online". Compare traditional with online, talking about his interest online.	interest toward online	tradition as passive and online as active
P33	sa se kestion ki ena diferan tip de learners. This is a question that there is different types of learners.	diferan tip learners. Different types of learners.	lanfaz lor learners. Focus on learners.	different types of learners	multiple intelligences
R	zot reponn bann kestion. You answer the questions.				
P31	rapel mw a to kestion. Remind me the question.				
P33					
P32					
R	ena. Has				
P33					
P34	ensuit. Then				
R	sa kestion la mem oubien enn lot, kapav to p anvi azout enn lot zafer. This question or a new one, may be you want to add anything.				
P31	tw a ki p diriz nou la. non, non mo pa enn dimoun ki soz, mw a parski mo pa inn fer PGCE. You are directed us. No, no I am a person who is, because I have not done PGCE.	mo pa inn fer PGCE. I have not done PGCE.			pedagogical skill
R	kapav to ti anvi azout kiksoz. May be you want to add something else.				
P31	non mo pe koz pou mw a la, kouma dir par examp mw a pa inn fer PGCE parski mo penn envi ale. No, I am talking about me, for example I have not done PGCE because I did not want to go.	pa inn anvi al fer PGCE. Did not want to do PGCE.		not motivated	motivation for pedagogical skill
R	repon bann kestion ki p vin apre, pa fer nanier. Pou zot ki veu dir online professional development, sa developman profesyonel la li anlign, pou zot ki vin dan zot latet, tw a to inn fini donn to lipinion. Online ki zot lopinion lor la. Answer the question which come after, it is not a problem. For you what online professional development means? This professional development is online, for you what come in your head, you have already give your opinion. what is your opinion on online.				
	online				
P31	non sa enn lot kestion sa man. No, this is another question man.				
P35	al fer korespondans, fer nou gagn tou online, kapav fer li kan to anvi. Do distance learning, we get all online, can do it when you want.	corespondans, tou online, li kan to anvi. Distance learning, all online, when you	online li kan to anvi. Online, it is when you want.	anytime , everything online	distance learning, all online
P31	kote "practical" la kouma dir, li inportan, to gagn zis online online. Practical side as if, it is important, you get only online online.	practical inportan. Practical is important.	zis online pa ase. Only online is not enough	no practical	importance of practical, barrier to online (no standardisation)

P34	<p>anfin mo osi, mo dakor, deja ilya le temps ki to "save" to pa bizin bouze me online osi li pa selma reserve a Moris, parski mw a, monn resi fer bann online course avek liniversite an partikilie an Amerique kom si, me la monn trouve to kapav gagn kom si kontak avek bann dimoun kom si a lextier, kapav partaz zot bann konesans, kom la, lane dernier ek set ane si mo pe fer enn exchange programme kouma dir, bann zelev de lAmerik set ane si sa va etre a la Norvege kouma dir, kapav kouma dir gagn kontak avek bann zelev a Moris, bann course online pou bann profeser kapav plis profesional dan so travay, parski li gagn bann esanz kom mw a, j'ai eu beauoup chance, tu vois, je vois comment ailleurs aussi fonctionne, c'est pa seulement focaliser sur Maurice, li focaliser ailleur aussi et mo pense li inportan et comme ci dan se la le online course, pa selman bann Morisien ki pe teach. Finally me also, I agree, already there is time you save, you do not have to move, but also online does not reserve solely to Mauritius, because I, I have been able to do online courses with universities mostly in America as if, but I have seen that you can get as if contact with other people as if abroad, can share their knowledge, as here, last year and this year I am doing an exchange programme as if, with the students from America, this year this will be those from Norway as if, can get as if contact with Mauritian students, the online courses for teachers can be more professional in their work, because they get these exchange as me, I was very lucky, you see, I saw how abroad also function, it does not focus on Mauritius only, it focuses abroad also and I think it is important and as if it is here, online course, not only Mauritian who is teaching.</p>	<p>dakor, "save" letemps, pa bizin bouze, online pas zis Moris, exchange programme, vinn plis profesional, konn lezot kontex, partaz konesans. Agree, save time, no need to move, online not only in mauritius, exchange programme, become more professional, know other context, share knowledge.</p>	<p>so lexperians avek online course, save le temps, konn lezot kontex, partaz konesans, professionalism. Her experiences with online course, save time, know other context, share knowledge, more professionalism.</p>	<p>sharing of knowledge, other context, save time. professionalism, foreign knowledge and context</p>	<p>knowledge sharing, travel, save time, benefit online</p>
P32					
P31					

P34					
P31	<p>le problem avek online, pa seki kouma mo dir gagn so kote pratik avek, mo pense enn profeser par ekzanp bizin si gagn kouma dir seki bann PGCE tou sa la fer, kot ena bann kouma apel sa. Kot bann Tutor vini aplik to inpe mem, kapav filme tou enkor fer sa. The problem with online, not like what I say, have the practical part also, I think a teacher for example need also to get as if what done in PGCE courses, where there is how do you call it, where the tutor come and explain you a little, can</p>	<p>pa ena pratik, konteni kours PGCE bizin ena online. Do not have practical, the content of PGCE course must be integrated in online courses.</p>	<p>profeser bizin gagn akse bann zafer dan bann kour koman PGCE online</p>	<p>tradition course content and online course content(not the same)</p>	<p>practical part, barrier to online</p>
R	tutor				
P33	<p>enn formasion pa kapav zis online, li inportan parski sa partaz la, partaz la inportan. A training cannot be only online, it is important because that sharing, sharing is important.</p>	<p>formasion pa kapav zis online, partaz inportan. Training cannot be only online, sharing is important.</p>	<p>lanfaz lor formasion ek partaz. Emphasis on training and sharing.</p>	<p>comparing traditional and online (sharing is difficult in traditional mode compare to online)</p>	<p>blended mode</p>
R					
P33	<p>parski heu li difisil arrive o moman kot tou sa dimoun la reynir dan enn sel plas fizik, assize, donk kontak. Because heu it is difficult arriving at a time where all people meet in only one physical place, sitting, so contact.</p>	<p>difisil pou tou dimoun zwen dan enn sel plas fizik. Difficult for all people to meet in one physical place.</p>		<p>sharing of ideas in online and traditional mode</p>	<p>benefit online</p>

P31	kontak fizik, human touch kouma dir li inportan, pou fer ena sharing kouma dir, lorinternet li fasil. <i>Physical contact, human touch as if, is important, for doing sharing as if, on the internet it is easu.</i>	human touch inportan, me fizikman li difisil kompare lor internet. Human touch important, but physically it is difficult compare to internet.	internet fasilite share me human touch li osi inportan	sharing in online mode, not human touch	benefit online and barrier
P34	non sa depan du learner aussi. <i>No this depends ... on the learner also.</i>	depan du learner. Depend on the learner.		type of learners	multiple intelligences
P33	non kouma mo redir twa eski si to attan enn zour kot to kapav gagn enn franse, amerikin en mem tan pe diskite kouma fer sa, zame pou kapav fer sa en mem tan. <i>No, as I am repeating to you, if you wait for a day where you can have a french, an american at the same time discussing, how to do that, that could never be done at the same time.</i>	difisil zwen dimoun diferan pei dan enn sel plas. Difficult to meet people in different countries in the same place.	sharing of ideas	advantages online and disadvantages traditional mode	difficulty for teachers to meet and share
P34	parseque, c'est parmi les meilleurs cours mem si. <i>Because, it is among the best course although.</i>	online meilleur cours. Online course is better.			best course, benefit online
P33	fizikman li pa posib, tandi qu'online et mw a parapor a sa sel zafer pe deroul Moris mem lekol par ekzanp pa forseman nou fer li online. <i>Physically it is not possible, whereas online and me with respect to this, only thing happening in Mauritius, even in the school for example not necessary we doing it online.</i>	difisil fer sharing dan metod tradisionel. Difficult to do sharing in traditional mode.	sharing e posib dan Moris ek ayer	sharing of ideas not just in Mauritius	
P31					

P33	mem dan Moris kouma dir plisier lekol li difisil pou enn moman. <i>Even in Mauritius as if, different schools it is difficult at a given time.</i>	difisil pou zwen fizikman mem dan Moris. Difficult to meet physical even in mauritius.		can meet online compare to traditional	physically impossible to meet even in mauritius, benefit online
P34	aster sharing la li, an witan kom si, se enn parmi les meilleurs cours que j'ai eu comme ci, mem si ce court durer parfois sa mais quand je compare sa avec les autres, les autres ne valaient pas grand chose comme ci pour moi comme ci pourquoi j'ai parle de sa comme sa, parceque j'ai vu sa tellement riche mem si c'est pour court durer le online course, moi franchement j'ai adoré, il n'y avait pa le contact physique peutetre mais. <i>now sharing, in eight years as if, it is one of the best course I had as if, although it is for short duration sometimes but when I compare with others, other worth not much as if, for me as if, why I am talking about this, because I saw it so rich... although it was for a short duration the online course, me really I loved, there was not physical contact may be but.</i>	sharing online meilleur cour, mem si c'est court, mem san contact physique	bon lexperians avek online, short term	comparing traditional and online (duration, richness of course, benefit online
P33	online				
P31	sa depend quel online course, ce n'est pa pour sa. <i>This depends which online course, it not for that.</i>	depend kel online course. Depend on which online course.			depend on course
P34	sa depan kel kour, koman se striktire, voila sa aussi. <i>This depends which course, how it is structured, here that too.</i>	koman se striktire. How it is structured.	striktir kour la. Structure of the course.	the course and the course structure	depend on structure
P31	ki kouma, kel kour, c'est tres important sa, kontak fizik li inportan. <i>Which is like, which course, it is very important, physical contact is important.</i>	kontak fizik inportan. Physical contact is important.			human contact

R	Eski zot pense zot ena dimoun inn fini gagn kontak avek le zot eski zot pense si ena 1 group profeser anligne kouma dir, si li gagn tou so bann sipor al fer klas. <i>Eski zot pou ale. Do you think you people are already in contact with other, do you think if a group of teachers online as if, if they get all the support to help in their class. will you go.</i>				
P31	mo pa pe kompran. <i>I do not understand.</i>				
P31	eski kour kouma profeser. <i>Is the course for teacher?</i>				
P35					
R	eski kour kouma profeser devlopman profesional, eski pou zot zot ti pou al ver sa faslile la. <i>Do a course like teacher professional development, will you go towards this facility.</i>				
P34	ca depend quel cours comme ci. <i>This depend which course as if.</i>	depend quel cours. Depends what course.			
P31	mw a mo ti pou mo ti pou ale, mo ti pou swiv li si li enn kour de kourt dure, si pa enn lane. <i>Me, I will go, I will follow if it is a short duration course (short duration), if it not a year.</i>	oui pou swiv online course pou kourt dure			
P35	li depan komie letan li p ale. <i>It depends how much time it will take (duration).</i>	komie letan. How much time (duration)		online course	course duration
P33	li depann osi, li depann a rapor avek le computer, li pa computer la, dir mw a al assize al share, mo pa sa. <i>It depends also, it depends on relation with your computer, it not the computer told me to go sit and share. I do</i>	pa kontan asize lor computer pou share			computer oriented

R	Eski zot pense 1 kour anligne mintnan la an 2015 pou profeser pou pli adapte an term de konteni e letan ki bann profeser ena pou zot fer li, si ti available eski zot trou sa adapte en 2015 adapter. Do you think a course online now in 2015 for teachers will be more adapted in term of content and time that teachers have to do it, if it is available will you find it adapted for 2015.				
P34	tu veut dir 1 cours enligne, comme si tout le temps comme ci sur quel durer, tu veux dire implimenter. You are saying a course online, as if all the time as if, on what duration, you want as if to implement it.	quel durer. What duration			course duration
R	normalman, enn kour pou profeser li pa ena dire parski koma sa Miss la pe dir, li bizin ongoing li, saveu dir li la to akse li kan to anvi, kan to pa anvi to pa fer li. Normally, a course for teachers it does not have as if, because as this lady is saying, it must be ongoing, that is, it is there, you can access it when you want, when you do not want, you do not do it.				
P31	an ai, i de pan ni mor disponiblite profeser la sa... ena ki pa renn nanie dan ma vie, ena ki p swiv enn kour aktuelman en mem tan. By the way, it depends on the disponibility of these teachers...there are some who do nothing in their lifes. There are some who are actually following courses at the same time.				availability
P33	parski li varie, exactement. Because it is true, exactly.				
	sa ki pou determinn sa. This would determine that.	disponibilite. disponibility			
P32	komm si dan enn situation kot to ena zanfan li pli adapte, parski to kapav al online kan tole, kan to fini fer tou to bann tas menazer. As if in a situation where you have children, it is more adapted go online when you want, when you finish doing your household task.	online pls adapte kan ena zanfan. Online more adapted when you have children.	family life match with online		

P33	to rentre, to poste to zistwar to ale to fer to bann zafer, apre dezerdtan, to gagn enn moman to revin cheke, li komplike ki o mem moman to bizin fer kour. You enter, you post you ideas/comments, you leave, you do whatever you have to do, then two hours later, when you have time, you come in and check, it is complicated that at the same time you have to do you course.	inpe lib kan kour la online, kapav fer plizir zafer an mem tan. A bit free when the course is online, can do different thing at the same time.	fer plizir zafer an mem tan. Do different thing at the same time.		benefit online
P32	exactement. Exactly	exactement. Exactly	avantage online		
P34	l'ideal je pense serai je reviens sur cette l'universite comme en Amerique la, ti bizin ena isi, ki fer bann online course toutan, sa veu dir li propoz plisier kour sa ve dir kan twa to lib, to envi "join in", to envi register to kapav tout, pou ena bann kour, heu mo pa konne ki zafer to ena et l mome antan ki profeserto konne ki ena liniversite ki p propoz enn bann kour online, donk a ninport kel moman, de tel mois a tel mois to kapav register, parske se kom sa ofet, quand j'aller suivre ce cours la, donc vu qu'ils ont mes cordonner comme ci, j'ai un mail qui me disent puisque j'ai fini tel cours, l'universite aussi propose d'autre cours si suis partante ou non, donc comme si c'est tout le temps la, donc c'est a moi de voir si je register ou non...Ça aurait été bon s'il y avait Ça comme ci a Maurice. ideally, I think would be, I come back to that university like in America, have it here, which offer online course all the time, this means that it proposes different courses, which means when you are free, you want to join in, you want to regster you can also, heu I do not know what thing you have and one time wait for teachers to know that a university that is proposing some courses online, therefore at any time, from which month to which month you can register, because it is like this by the way, when I followed this course, therefore seeing that they have my contact information as if, I had mail which said as you have finish this course, the university also proposes other courses, if I keen or not, so as if it is all time available.	online course bizin ena touletan, kapav register kan anvi. Online course must there all the time, can register when you want.	online course kapav register ninpor kan e ninpor ou	available anytime and anywhere	benefit online

P34	<p>l'ideal je pense serai je reviens sur cette l'universite comme en Amerique la, ti bizin ena isi, ki fer bann online course toutan, sa veu dir li propoz plisier kour sa ve dir kan twa to lib, to envi "join in", to envi register to kapav tout .pou ena bann kour, heu mo pa konne ki zafer to ena et 1 momen antan ki profeserto konne ki ena liniversite ki p propoz enn bann kour online, donk a ninport kel moman, de tel mois a tel mois to kapav register, parske se kom sa ofet, quand j'aller suivre ce cours la, donc vu qu'ils ont mes cordonner comme ci, j'ai un mail qui me disent puisque j'ai fini tel cours, l'universite aussi propose d'autre cours si suis partante ou non, donc comme si c'est tout le temps la, donc c'est a moi de voir si je register ou non ...Ça aurait été bon s'il y avait Ça comme ci a Maurice. <i>ideally, I think would be, I come back to that university like in America, have it here, which offer online course all the time, this means that it proposes different courses, which means when you are free, you want to join in, you want to resgister you can also, heu I do not know what thing you have and one time wait for teachers to know that a university that is proposing some courses online, therefore at any time, from which month to which month you can register, because it is like this by the way, when I followed this course, therefore seeing that they have my contact information as if, I had mail which said as you have finish this course, the university also proposes other courses, if I keen or not, so as if it is all time available.</i></p>	<p>online course bizin ena touletan, kapav register kan anvi. Online course must there all the time, can register when you want.</p>	<p>online course kapav register ninpor k an e ninpor ou</p>	<p>available anytime and anywhere</p>	<p>benefit online</p>
P33	<p>peut etre aussi commencer par un ptit forum kot kapav poz enn bann keston essay resourd bann problem ki to in gagne, ke se swa paraport a management ou akademik, alor si nou bizin enn bann materiel nou kapav gagnie nou kapav fer bann demande, si enn dimoun ena sa bann materiel la li kapav send nou. <i>May be also start with a small forum where can ask question, try to solve the problem which you get, whether it is related to management or academic, then if we need a material, we can get it, we can make a request, if a person has this material, he/she can send it to you.</i></p>	<p>forum kot kapav post comment, ou akse bann materiel. Forum where can post comment, or access some materials</p>	<p>sharing</p>	<p>forum, sharing</p>	<p>benefit online</p>
P34	<p>et le forum pourrait rester ouvert a ce moment la. <i>And the forum would be open all the time at this moment.</i></p>				

P33	le problem a ce moment la seki profeser la vis a vis heu administrasion si bizin enn lot forum ...parski li pa kapav enn zafer anonim sa, kan to pe rent lor bann forum to bizin servi enn fos non. The problem at this moment... is that teachers with respect heu to administration,if you need another forum... because this can be something anonymous, when you login the forum you must use a pseudonime.				
P35	kapav anonim. Can be anonymous.	anonim. Anonyme	anonim. Anonyme		anonymous
R	ena de sistem, de kalite ena. There are two system, there are two tipes.	de kalite. Of good quality			
P33	ah ena de sistem, parski to pou met to non dan tel plas, me li pou enn gagn problem. Ah there are two system, because you will put your name in a place, but it will be a problem. E.g put your name in a forum.				
R	pa pou konne si twa sa ou pa twa sa. Will not know whether it is you or not.				
P33	kapav enn problem avek ... oui sa mo pa ti konne sa. Can have problem with...yes this I did not know.				
R	ki bann resours zot pense bizin ena pou nou kapav al swiv enn kour anligne, ki bann resours bizin ena pou ki ed enn dimoun pou al fer sa kour la.what are the resources you think will be needed to follow an online course, what resources must have to help person to go for this				
P35	tu veut dir en la personne mem. You means face-to-face.				
R	Ninpor. Anything				
P34	a lekol. A school				
P33	deza bizin enn sours de motivasion, bizin kapav tir profi de sa. Already need, a source of motivation, must be able to take out profit of this.	bizin tir profi. Motivation, must be beneficial to	teacher's need	beneficial to the teacher	
P34	il faut etre discipliner. You must be disciplined.	discipliner			self-discipline
P35	resours tonn dir la. You have said resources.				
R	li ninport, resours la li kapav dan ninpor ki form. It is anything, resources that can be in any form.				
P33	resours de la personne ou swa parapor. Resources of the person or may be related to.				
P31	internet. Internet	internet		tool	infrastructure
R	li kapav materiel, li kapav. It can be materials, it can be.				
P31	internet, computer, laptop,non, kouma apel sa connecting device. Internet, computer, laptop, no, how do we name this connecting	internet, computer, laptop		tool	infrastructure
P33	fode ki sa profeser la trouv so compt ladan. The teacher must find his/her interest in that.	trouve so kont la dan		personal	personal satisfaction
P34	soz osi prozektter. Thing also projector.	prozektter			
P34	tablet, pen drive. Tablet, pen drive	tablet, pendrive		tool	infrastructure
R					
P34	parfois c'est audio parfois c'est video. Sometimes it's audio sometimes it's video.				
P31	ouias. Yes				
P34	bann speakers non. The speakers no	speakers		tool	infrastructure
R	ine fini. Has finished.				
P32	Webcam	webcan		tool	infrastructure
R	kapav poz lot kestion dernie kestion mo poze ki anpes, ki bann fakter ki anpes rant ladan. can ask a lot of questions, last question that I will ask is what prevent,what factors prevent go online.				
P34					
R	ki anpes twa al ladan. What prevent you to go online.				
P35	online				
P32	le temps, parfois ce finance. Time, sometimes finance.	le temps, finance. Time, finance.			motivating factors

P31	kour la bom, li pa apropriate pou mwa, mwa mo pa gagn letan. The course is boring, it is not appropriate for me, I do not have time.	kour bom, pa adapte, pa gagn le tetan. Boring courses, not adapted, do not have		personal feeling	inhibiting factors
P33	bizin ena enn dezir, dezir gouveman, dezir politik, osi dan zistwar la. Must have the desire, desire of the government, political desire also form part of the system.	dezir personel, politik. Personal desire, political			
P35	mo pense ki kour la. I think that this course.				
P34	eski li repetitif ou non, eske se reconnu, eske il ya quelque chose a la fin, si pa ena nanie, kapav pa ena okenn motivasion, apre si li repetitif, osi deza tende, deza konne. Is it a repetition or no? Is it recognised? is there anything at the end? if there is nothing, there can be no motivation, moreover it is repetitive, also already heard about, already known.	repetision, reconnu ou pa, deza kone, deza tende. Repetition, recognise or not, already know, already		personal feeling	inhibiting factors
P31	ekout dekourazman bann kamarad dir pa swiv sa kour la, parski pa servi nanie. Listen, discouragement, some friends say do not follow this course, because it is useless.	kamarad dekouraz twa. Friends discourage you	peer pressure	peer pressure	social influence
P33	non be sistem a Moris, sistem PSSA, li pa enn sistem kot ankouraz twa pou al swiv kour, dan le sans ki to pena okenn, anfin se vre ki to bizin ena enn dezir personel pou kapav progresse e an mem tem, vu ki to p progre, to kas osi. No, but system in Mauritius, system PSSA (private Secondary School Authority), it is not a system where you are encourage to go following courses, in the sense that you do not have something, finally it is true that you need to have a personal desire for you to progress and at the same, as you are progressing, your salary must also.	sistem pa ankouraz profeser pou al swiv kour, dezir personel. System does not encourage teachers to follow courses, need personal desire.	polisi pa ankouraz sa, motivasion personel	policy decision, personal satisfaction	not encourage by the system (no promotion) (inhibiting factors), personal growth
R					
P33	ouais parski to pe investi ofet, kom si pou ki sanla, pou lekol, pou to bann zelev ek pou pei, gouveman mem pa ankouraz sa kor paraetatik pa rekonet ki, to pe konpran. Yes because you are investing by the way, as if for whom, for the school, for your students and for the country, government does not even encourage this, parastatal body does not recognise this, you understand.	pa rekonet par gouveman, polisi, stakeholder. Do not recognise by government, policy, stakeholders.	polisi pa rekonet sa. Policy does not recognise this	investing for the school, students, recognition	investment and return (inhibiting factors), recognition by the paying agent
R					
P33	sistem ledikasion la pa rekonet sa fason. Educational system does not recognise this way.	sistem ledikasion pa rekonet sa fason la. Educational system does not recognise this way of learning.	educational system	formal and informal	recognition of online learning, informal learning
P33	exactmen. Exactly.	exactement. Exactly.			
P31	bizin gagn omwin Rs5000 kan to swiv enn kour, pa kouma dir. Must get atleast Rs5000 when you have followed a course, not as if.	saler pli bokou. Salary increase	saler. salary		
P34	posibilite promotion osi kot to kapav evolue, be la. Possibility of promotion also, you can evolve (progress) but now.	promotion, evolue. Promotion, progress.	promotion, evolue (progress)	personal satisfaction	growth, promotion and progress
P33	sistem edikatif, kionseyl le zot. Educational system, which advice				
P31	pena tou sa la. Do not have all these.	pa ena tou sa. Do not have all these.			
P33	tandi ki ena. while there is.				
P31	nou kontan, nou kelke par pour etre prof enn sinp degre sifi, enn sinp degre korek. We are happy, somehow to be a teacher a simple degree is sufficient, a simple degree is correct.	enn sinp degre sifi pou etre prof. A simple degree is sufficient to be a			qualification for teaching
P33	sa bann responsabilite ki ena. Those responsibilities that you have.				
P35	ase moman la, kouma pe dir enn sinp degre li sifi, pa pou, enn master pou mem sujet, to pa pou edikasion. At this moment, as it is being said, a simple degree is sufficient, not for, a master for the same sujet, not for education.	enn sinp degre sifi, a simple degree is sufficient		requirement	qualification for teaching
P33	mem sa "Anne" si to pa gagn motivasion pou fer li mem sa li pa vinn. Even that Anne, if you do not get motivation for doing this.	pa ena motivation. Do not have motivation.		motivation	
P32	konbien to gagne anplis lor to saler. How much will you get more on your salary.	saler res parey. Salary the same.			
P34	on ne "praise" pa sa assez. We are not praise enough.	pa ase "praise". Not enough praise	praising		

	de zan masters, to kapav dir rs75000 par an rs 150 000, pou Rs 30000. 2 years master, you can say Rs 75000 per year = Rs150000 to get only Rs30000 monthly.				not praise enough, investment and return
P33		investing in study		not satisfy with the return	
P34	sa devient un peu plus . This will a bit more.	un plus. A plus		additional	
P31					
P33	sa fait.				

Appendix K: Gatekeeper letter



ST JOSEPH'S COLLEGE

21st July 2014

Mr Jianey FLORE
Lot 36
Morcellement SLDC
Petit Verger
Pointe- aux- Sables

Dear Sir,

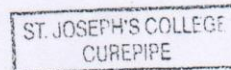
**MASTERS/PHD RESEARCH PROPOSAL AND ETHICAL
CLEARANCE APPLICATION(HUMAN AND SOCIAL SCIENCES)**

Further to our meeting, with reference to the project you are presently working on, I am pleased to inform you that the Management of St Joseph's College agrees to be engaged in your survey.

A sample of teachers, corresponding to your specific requirements, will participate in the statistical exercise.

We are looking forward to receiving more information in connection with the survey process and avail ourselves of this opportunity to wish you Good Luck in your studies.

Yours Faithfully



**DOMINIQUE SEBLIN
RECTOR**

Appendix L: Multiple Regression (Behavioural intention to use OPD)

Table 10: Model summary

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.763 ^a	.582	.562	3.74254	.582	28.324	3	61	.000
2	.853 ^b	.727	.709	3.04886	.145	31.915	1	60	.000
3	.853 ^c	.728	.704	3.07271	.000	.072	1	59	.789
4	.857 ^d	.734	.706	3.06432	.006	1.324	1	58	.255
5	.861 ^e	.741	.709	3.04677	.008	1.670	1	57	.201
6	.863 ^f	.745	.709	3.05088	.004	.846	1	56	.362
7	.865 ^g	.748	.707	3.06098	.003	.631	1	55	.430

a. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy

b. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions

c. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD

d. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences

e. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledgeandbeliefs1

f. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledgeandbeliefs1, Content and activities

g. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledgeandbeliefs1, Content and activities, Evidence of student performance

Appendix M: ANOVA table for behavioural intention to use OPD

Table 11: ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1190.151	3	396.717	28.324	.000 ^b
	Residual	854.403	61	14.007		
	Total	2044.554	64			
2	Regression	1486.820	4	371.705	39.987	.000 ^c
	Residual	557.734	60	9.296		
	Total	2044.554	64			
3	Regression	1487.504	5	297.501	31.510	.000 ^d
	Residual	557.050	59	9.442		
	Total	2044.554	64			
4	Regression	1499.932	6	249.989	26.623	.000 ^e
	Residual	544.622	58	9.390		
	Total	2044.554	64			
5	Regression	1515.434	7	216.491	23.322	.000 ^f
	Residual	529.120	57	9.283		
	Total	2044.554	64			
6	Regression	1523.312	8	190.414	20.457	.000 ^g
	Residual	521.242	56	9.308		
	Total	2044.554	64			
7	Regression	1529.226	9	169.914	18.135	.000 ^h
	Residual	515.328	55	9.370		
	Total	2044.554	64			

a. Dependent Variable: Behavioural intention to use OPD

b. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy

c. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions

d. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD

e. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences

f. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledgeandbeliefs1

g. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledgeandbeliefs1, Content and activities

h. Predictors: (Constant), Social factors, Effort expectancy, Performance expectancy, Facilitating conditions, challenges of OPD, Teachers' experiences, knowledgeandbeliefs1, Content and activities, Evidence of student performance

Appendix N: Model for behavioural intention to use OPD

Table 12: Coefficients

		Coefficients ^a					Collinearity Statistics	
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
		B	Std. Error	Beta				
1	(Constant)	8.188	2.660		3.078	.003		
	Performance expectancy	.502	.098	.563	5.103	.000	.563	1.776
	Effort expectancy	-.083	.158	-.057	-.524	.602	.588	1.701
	Social factors	.327	.089	.355	3.665	.001	.730	1.369
2	(Constant)	3.700	2.308		1.603	.114		
	Performance expectancy	.281	.089	.315	3.151	.003	.455	2.199
	Effort expectancy	-.074	.128	-.051	-.576	.567	.588	1.701
	Social factors	.191	.077	.207	2.493	.015	.658	1.520
3	Facilitating conditions	.598	.106	.511	5.649	.000	.555	1.800
	(Constant)	3.835	2.379		1.612	.112		
	Performance expectancy	.296	.105	.332	2.806	.007	.330	3.028
	Effort expectancy	-.064	.135	-.044	-.472	.639	.540	1.851
	Social factors	.197	.080	.214	2.449	.017	.605	1.652
4	Facilitating conditions	.591	.111	.504	5.330	.000	.516	1.939
	challenges of OPD	-.029	.109	-.029	-.269	.789	.408	2.453
	(Constant)	4.066	2.381		1.708	.093		
	Performance expectancy	.266	.108	.298	2.457	.017	.311	3.211
	Effort expectancy	-.121	.143	-.082	-.840	.404	.476	2.100
	Social factors	.150	.090	.163	1.664	.102	.480	2.083
	Facilitating conditions	.548	.116	.468	4.706	.000	.464	2.154
5	challenges of OPD	-.055	.111	-.054	-.497	.621	.391	2.557
	Teachers' experiences	.120	.104	.165	1.150	.255	.223	4.474
	(Constant)	2.833	2.553		1.110	.272		
	Performance expectancy	.247	.109	.277	2.273	.027	.306	3.272
	Effort expectancy	-.143	.144	-.098	-.997	.323	.469	2.132
	Social factors	.145	.090	.158	1.622	.110	.479	2.086
	Facilitating conditions	.535	.116	.457	4.604	.000	.461	2.170
6	challenges of OPD	-.068	.111	-.066	-.611	.543	.388	2.577
	Teachers' experiences	.123	.103	.169	1.185	.241	.223	4.476
	knowledgeandbeliefs1	.099	.076	.100	1.292	.201	.754	1.326
	(Constant)	2.397	2.599		.922	.360		
	Performance expectancy	.206	.118	.231	1.755	.085	.262	3.815
	Effort expectancy	-.149	.144	-.102	-1.032	.307	.468	2.135
	Social factors	.138	.090	.149	1.525	.133	.475	2.105
	Facilitating conditions	.506	.121	.432	4.200	.000	.430	2.328
7	challenges of OPD	-.061	.112	-.059	-.544	.588	.386	2.590
	Teachers' experiences	.130	.104	.179	1.248	.217	.222	4.501
	knowledgeandbeliefs1	.084	.078	.085	1.071	.289	.722	1.386
	Content and activities	.083	.090	.092	.920	.362	.457	2.189
	(Constant)	1.863	2.694		.692	.492		
	Performance expectancy	.195	.119	.218	1.637	.107	.258	3.874
	Effort expectancy	-.118	.150	-.081	-.786	.435	.436	2.291
	Social factors	.135	.091	.147	1.494	.141	.475	2.107
8	Facilitating conditions	.512	.121	.437	4.226	.000	.428	2.337
	challenges of OPD	-.043	.114	-.041	-.373	.711	.371	2.698
	Teachers' experiences	.114	.106	.157	1.075	.287	.215	4.661
	knowledgeandbeliefs1	.088	.079	.090	1.124	.266	.718	1.394
	Content and activities	.147	.122	.163	1.213	.230	.255	3.928
	Evidence of student performance	-.740	.932	-.092	-.794	.430	.342	2.925

a. Dependent Variable: Behavioural intention to use OPD

Appendix O:
Matrix

showing how the questions for the focus groups are related to the constructs of the conceptual framework

Table 13: Matrix showing how the questions for the focus groups are related to the constructs of the conceptual framework

constructs	Related question number in the focus group discussion	Notes
Performance expectancy	4, 6, 8, 19	To know whether teachers view OPD as a way to improve their performance.
Facilitating conditions	8, 10, 11, 16, 19, 20, 21, 22	To know what are the facilitating conditions for OPD
Social factors	8, 17, 18	To know what are the social factors that influence OPD.
Effort expectancy	8,10,11, 13	To know how they rate their effort expectancy regarding OPD.
Content & activities	3, 11, 14, 15	To know whether the content of OPD satisfy teachers' needs.
Inhibiting factors	21, 22, 19	To know what are the inhibiting factors of OPD.
Evidence of student performance	5, 8	To know what is the impact of PD on student learning.
Beliefs and knowledge	1, 2, 3, 4, 5, 6, 8, 7, 11, 13	To know teachers' beliefs and knowledge about OPD. And also their experiences with face-to-face and online learning.

Appendix P: Relation construct and questionnaire

Table 14: Relation construct and questionnaire

Construct	Part in the questionnaire	Question number
Performance expectancy	7	1-13
Effort expectancy	6	2, 4, 7,8, 10,11,15
	4	2
	5	9
	8	15,17,18,19
Facilitating conditions	3	17
	4	2,4,5,6,8,9
	5	1-15
Social factors	3	15
	5	1
	9	1,2,3,5,6,7,8,9,10
Evidence of students performance	4	11, 13
	3	9,10
	5	14,15
	8	1,6,7,8,11,12,13,14,16
Teacher's experiences with PD	8	1-19
Challenges of online teacher training	6	1,2,3,5,6,7,9,10,11,12,13,14,16,17,18,19
	7	7
	8	14,16
Content and activities	3	14
	4	3,4,5,6, 7,8,9,10,12,13
	5	2,6,
Knowledge and beliefs	3	1-17,19

Behavioural intention to use OPD	4	1,
	5	4,5,7,8,9,10,11,12,13,14,15
Online teacher training use behaviour	7	2,3,5,7,8,9,
	5	2,3, 4,6,8,9,11
	8	2,7
	9	3,10

Appendix Q: Quantitative findings

Table 15: Teachers' experience with teacher training programmes

	Mode	Median	Agree (%)	Neutral (%)	Disagree (%)
Theory versus Practice	2	2	72.3	26.2	1.5
One-size-fits all	2	2	66.1	30.8	3.1
Course duration	3	2.5	40	50.8	9.2
Professional growth and progress	2	2	75.3	21.6	3.1
Teacher PD and student's learning outcomes	2	2	72.3	27.7	0
Social influence	3	3	35.4	56.9	7.7
School context	2	2	69.2	30.8	0

Table 16: Online teacher training usage

Sub-theme	Mode	Median	Agree (%)	Neutral (%)	Disagree (%)
Teacher conception about online learning	2	2	58.5	38.4	3.1
Motivation	2	2	75.4	23.1	1.5

Benefits of online teacher training	2	2	2	66.	30.8	3
Facilitating conditions	2	2		57	41.5	1.5

Table 17: Challenges of online teacher training

Sub-theme	Mode	Median	Agree (%)	Neutral (%)	Disagree (%)
Implementation	2	2	92.3	7.7	0
Formal and informal learning	2	2	77	21.5	1.5
Course structure	2	2	73.8	26.2	0
Unfamiliar	2	2.5	49.2	37	13.8
Health problem	2	2	69.2	21.5	9.3
Human contact	3	2.5	43.1	47.7	9.2
Self-discipline	2	2	66.2	29.2	4.6

Trustworthiness	2	2	63.2	33.8	3
Curriculum	2	2	67.8	29.2	3

Appendix R: Median of construct

Table 18: Showing median of the different construct

Construct	Mode	Median	Agree (%)	Neutral (%)	Disagree (%)
Performance expectancy	2	2	81.5	18.5	0
Effort expectancy	2	2	75.4	24.6	0
Social influences	3	3	35.4	56.9	7.7
Facilitating conditions	2	2	57	41.5	1.5
OPD content and Activities	2	2	69.2	30.8	0
Evidence of students' performance	2	2	83.1	16.9	0
Challenges of OPD	2	2	86.2	12.3	1.5
Teachers' experiences with OPD	2	2	73.8	26.2	0
Knowledge & beliefs	2	2	95.4	3.1	1.5
Behavioral intention to use OPD	2	2	60.1	38.4	1.5

Online teacher training usage	2	2	73. 9	24.6	1.5
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Appendix S: Summary of Hierarchical Regression analysis for variables predicting online teacher training usage

Table 19: Summary of Hierarchical Regression analysis for variables predicting online teacher training usage

Model		Coefficients ^a					Correlations			Collinearity Statistics	
		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	15.872	4.662		3.405	.001					
	Behavioural intention to use OPD	1.636	.159	.791	10.276	.000	.791	.791	.791	1.000	1.000
2	(Constant)	14.884	4.898		3.039	.003					
	Behavioural intention to use OPD	1.553	.200	.751	7.757	.000	.791	.702	.600	.637	1.569
3	Social factors	.127	.185	.066	.686	.495	.519	.087	.053	.637	1.569
	(Constant)	4.309	4.672		.922	.360					
	Behavioural intention to use OPD	1.331	.176	.644	7.562	.000	.791	.696	.497	.596	1.677
4	Social factors	-.073	.162	-.038	-.450	.655	.519	-.057	-.030	.599	1.671
	Effort expectancy	1.144	.229	.379	4.984	.000	.652	.538	.328	.748	1.337
	(Constant)	2.680	4.527		.592	.556					
	Behavioural intention to use OPD	.933	.231	.451	4.038	.000	.791	.462	.254	.318	3.145
5	Social factors	-.096	.155	-.051	-.619	.538	.519	-.080	-.039	.596	1.677
	Effort expectancy	1.092	.221	.361	4.938	.000	.652	.538	.311	.741	1.349
	Facilitating conditions	.634	.252	.262	2.519	.014	.744	.309	.159	.367	2.727
	(Constant)	4.960	3.715		1.335	.187					
	Behavioural intention to use OPD	.505	.203	.244	2.481	.016	.791	.307	.128	.273	3.666
6	Social factors	-.085	.127	-.045	-.672	.504	.519	-.087	-.035	.596	1.677
	Effort expectancy	.570	.203	.189	2.809	.007	.652	.343	.144	.585	1.710
	Facilitating conditions	.512	.207	.211	2.477	.016	.744	.307	.127	.363	2.758
	Performance expectancy	.847	.152	.460	5.583	.000	.856	.588	.287	.390	2.563
	(Constant)	3.292	3.986		.826	.412					
	Behavioural intention to use OPD	.468	.206	.226	2.273	.027	.791	.286	.117	.266	3.762
7	Social factors	-.086	.127	-.045	-.682	.498	.519	-.089	-.035	.596	1.677
	Effort expectancy	.532	.205	.176	2.590	.012	.652	.322	.133	.569	1.758
	Facilitating conditions	.522	.206	.216	2.530	.014	.744	.315	.130	.362	2.763
	Performance expectancy	.824	.153	.447	5.391	.000	.856	.578	.276	.383	2.612
	knowledgeandbeliefs1	.138	.121	.068	1.136	.260	.503	.148	.058	.740	1.350
	(Constant)	3.491	3.979		.877	.384					
	Behavioural intention to use OPD	.475	.205	.230	2.313	.024	.791	.293	.118	.266	3.765
8	Social factors	-.083	.126	-.043	-.656	.514	.519	-.087	-.034	.596	1.678
	Effort expectancy	.487	.209	.161	2.335	.023	.652	.295	.119	.549	1.823
	Facilitating conditions	.488	.208	.201	2.345	.023	.744	.297	.120	.354	2.822
	Performance expectancy	.792	.155	.429	5.109	.000	.856	.560	.261	.370	2.700
	knowledgeandbeliefs1	.109	.123	.054	.884	.380	.503	.116	.045	.710	1.408
	Evidence of student performance	1.215	1.066	.073	1.140	.259	.575	.149	.058	.638	1.567
	(Constant)	-2.027	2.898		-.699	.487					
	Behavioural intention to use OPD	.277	.147	.134	1.886	.064	.791	.244	.068	.257	3.885
	Social factors	-.107	.089	-.056	-1.206	.233	.519	-.159	-.044	.595	1.680
	Effort expectancy	.670	.149	.222	4.496	.000	.652	.515	.162	.534	1.871
Facilitating conditions	.377	.147	.156	2.557	.013	.744	.323	.092	.351	2.850	
Performance expectancy	.542	.114	.294	4.753	.000	.856	.536	.171	.340	2.940	
knowledgeandbeliefs1	.066	.087	.033	.762	.450	.503	.101	.027	.707	1.414	
Evidence of student performance	-3.889	1.005	-.234	-3.870	.000	.575	-.459	-.140	.357	2.801	
Content and activities	1.022	.134	.546	7.652	.000	.835	.715	.276	.256	3.911	
9	(Constant)	-2.829	2.999		-.943	.350					
	Behavioural intention to use OPD	.290	.149	.140	1.943	.057	.791	.256	.071	.252	3.967
	Social factors	-.116	.102	-.061	-1.128	.264	.519	-.152	-.041	.456	2.192
	Effort expectancy	.666	.167	.220	3.989	.000	.652	.477	.145	.432	2.317
	Facilitating conditions	.423	.155	.175	2.734	.008	.744	.349	.099	.323	3.095
	Performance expectancy	.485	.135	.263	3.595	.001	.856	.439	.131	.246	4.063
	knowledgeandbeliefs1	.058	.088	.028	.655	.515	.503	.089	.024	.701	1.426
	Evidence of student performance	-4.145	1.039	-.249	-3.988	.000	.575	-.477	-.145	.338	2.959
	Content and activities	1.049	.137	.560	7.686	.000	.835	.723	.279	.248	4.033
	Teachers' experiences challenges of OPD	-.058	.119	-.039	-.488	.627	.743	-.066	-.018	.210	4.759
	.142	.127	.067	1.121	.267	.600	.151	.041	.370	2.705	

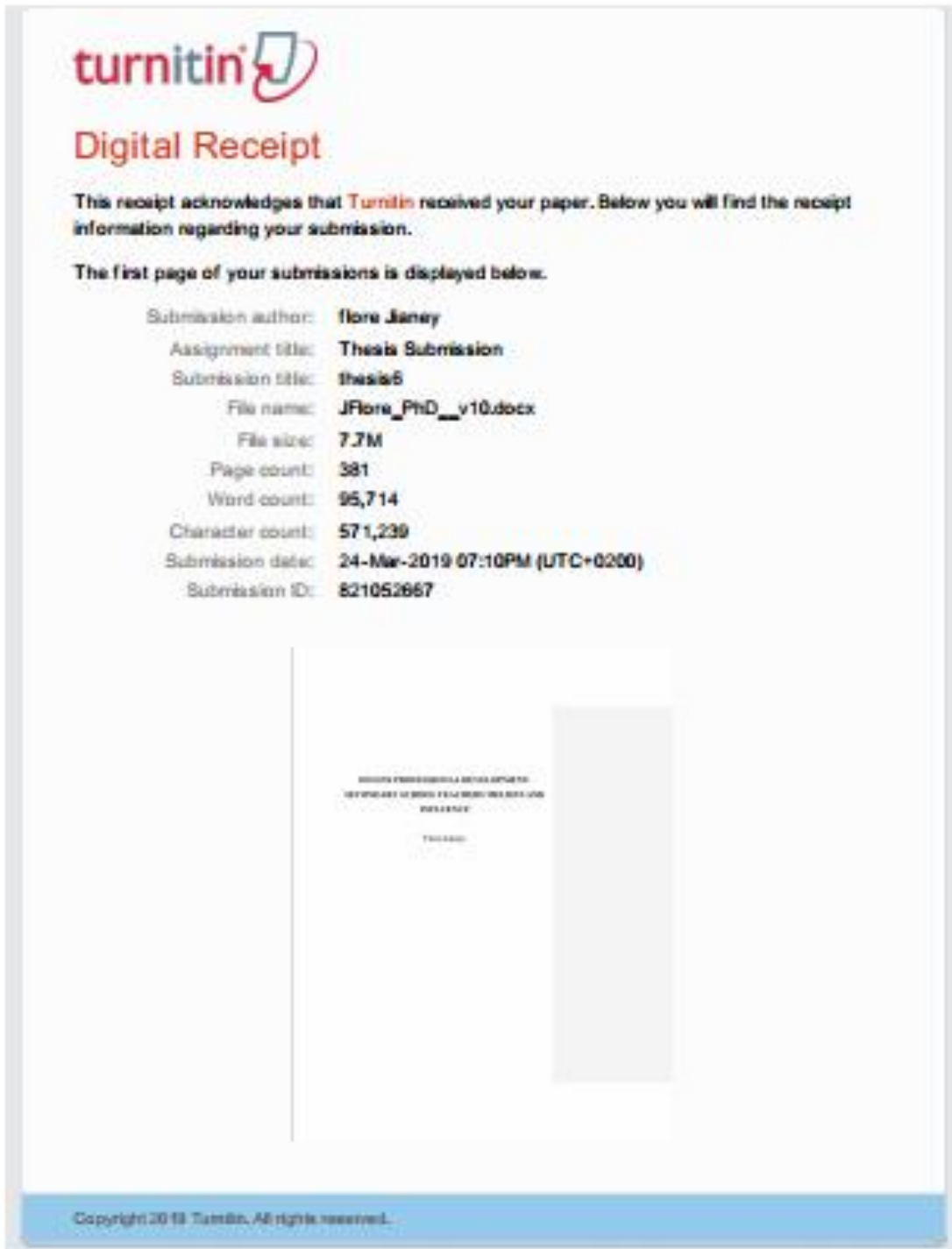
a. Dependent Variable: Online teacher training usage

Appendix T: Collinearity : Pearson Correlations

Table 20: Correlations

		Correlations								
		Online teacher training usage	Behavioural intention to use OPD	Social factors	Effort expectancy	Facilitating conditions	Performance expectancy	knowledgeandbeliefs1	Evidence of student performance	Co a
Pearson Correlation	Online teacher training usage	1.000	.791	.519	.652	.744	.856	.503	.575	
	Behavioural intention to use OPD	.791	1.000	.602	.451	.792	.700	.439	.435	
	Social factors	.519	.602	1.000	.448	.519	.484	.311	.314	
	Effort expectancy	.652	.451	.448	1.000	.418	.619	.402	.477	
	Facilitating conditions	.744	.792	.519	.418	1.000	.618	.348	.444	
	Performance expectancy	.856	.700	.484	.619	.618	1.000	.457	.527	
	knowledgeandbeliefs1	.503	.439	.311	.402	.348	.457	1.000	.422	
	Evidence of student performance	.575	.435	.314	.477	.444	.527	.422	1.000	
	Content and activities	.835	.640	.431	.450	.604	.678	.457	.776	
	Teachers' experiences	.743	.715	.704	.685	.657	.741	.413	.409	
challenges of OPD	.600	.458	.501	.612	.345	.700	.402	.435		
Sig. (1-tailed)	Online teacher training usage	.000	.000	.000	.000	.000	.000	.000	.000	
	Behavioural intention to use OPD	.000	.000	.000	.000	.000	.000	.000	.000	
	Social factors	.000	.000	.000	.000	.000	.000	.006	.005	
	Effort expectancy	.000	.000	.000	.000	.000	.000	.000	.000	
	Facilitating conditions	.000	.000	.000	.000	.000	.000	.002	.000	
	Performance expectancy	.000	.000	.000	.000	.000	.000	.000	.000	
	knowledgeandbeliefs1	.000	.000	.006	.000	.002	.000	.000	.000	
	Evidence of student performance	.000	.000	.005	.000	.000	.000	.000	.000	
	Content and activities	.000	.000	.000	.000	.000	.000	.000	.000	
	Teachers' experiences	.000	.000	.000	.000	.000	.000	.000	.000	
challenges of OPD	.000	.000	.000	.000	.002	.000	.000	.000		
N	Online teacher training usage	65	65	65	65	65	65	65	65	
	Behavioural intention to use OPD	65	65	65	65	65	65	65	65	
	Social factors	65	65	65	65	65	65	65	65	
	Effort expectancy	65	65	65	65	65	65	65	65	
	Facilitating conditions	65	65	65	65	65	65	65	65	
	Performance expectancy	65	65	65	65	65	65	65	65	
	knowledgeandbeliefs1	65	65	65	65	65	65	65	65	
	Evidence of student performance	65	65	65	65	65	65	65	65	
	Content and activities	65	65	65	65	65	65	65	65	
	Teachers' experiences	65	65	65	65	65	65	65	65	
challenges of OPD	65	65	65	65	65	65	65	65		

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