# A MODEL FOR ICT PROFESSIONAL SKILL DEVELOPMENT: A CASE STUDY FOR TEACHERS IN PRIMARY SCHOOLS IN TSHWANE SOUTH DISTRICT

**Lovemore Motsi**
School of Computing
University of South Africa
South Africa
motsil@unisa.ac.za

**Mmankoko Ziphorah Ramorola**
Department of Science and Technology
University of South Africa
South Africa
ramormz@unisa.ac.za

**Abstract:** Despite the critical importance of in-service education programs (INSETs) for teachers' on-going professional development, educators often report problems concerning many INSETs. This paper investigates factors that are likely to motivate teachers to use ICT based INSET programs to enhance their professional skill development. From the identified factors, a model for ICT based professional skill development for school teachers was developed. By reviewing the literature, these factors were established and were used in the development of the research model. Underpinning theories, those of the Unified Theory of Acceptance and Use of Technology (UTAUT) and Theory of Planned Behaviour (TPB) were adopted and used in this study. A survey was conducted among primary school teachers and the sample consisted of 82 respondents in Tshwane South District in Gauteng Province. A closed ended questionnaire was used to collect data, and thereafter the data was analyzed. The results of the analysis indicate that, performance expectance (PE) was found to have the highest predicting power of 29.4, followed by effort expectance (EE) 24.7%. Behaviour intention (TBI) was ranked the least with 5.6%. Overall the results of the study predict an 60.9% success rate if this ICT based model for teacher professional skill development will be implemented in primary schools.

Keywords: Professional development; Information and communication technology, school teachers

## 1. Introduction

Today, there are various trends that shape and change the world of education today. Those trends include changing age structures, knowledge intensive service economies, changing world of work and jobs, the concept of a learning society, rapid developments in ICT (information and communications technology), and social connections and values (Organization for Economic Co-operation and Development, 2008). It is for this reason that policy-makers have increasingly focused on the need to develop system capacities for educational reform and change. Change attempts in education mostly aim to narrow the widening gap between the traditional capabilities of educational systems and emerging demands of the information age (Guskey, 2008). In addition, human beings change in order to keep pace with a rapidly changing world. However, considering the continuum of change, educators appear to be less and less clear about what constitutes a legitimate reason for the change (Uline, 2001). In many developed countries, teachers have found themselves under pressure from a drive to increase the quality of education and improve outcomes for pupils in order to create a more skilled and educated workforce (Olsen, 2010). According to James and McCormic (2009), today's situation presents a challenge for teachers and schools who will need to focus on two things simultaneously: teaching the substance of subjects, and helping pupils to learn the ideas and

practices associated with the process of learning itself. Hence, it can be said that the profession of teaching requires utilizing new trends and knowledge throughout the career which leads teachers to follow continuous professional development. In this way, teachers may be able to fulfil their professional roles in the changing contexts in which teachers work and learning take place (Sandholtz, 2006).

## 2. Background of the study

INSET programmes are considered as unique opportunities for teachers to develop themselves both professionally and individually. Due to rapid changes in every phase of societies around the world, teachers' adaptations to these changes and long-term professional development have gained more attention. As a result, researchers such as Ainscow (2004); Garet, Porter, Desimone, Birman and Yoon (2008) argued that teacher professional development and continual deepening of knowledge and skills are a major focus of systemic change and development in education. James and McCormic, (2009), further indicated that in this day and age, to make knowledge economy successful, individuals and communities will constantly need to learn new things, apply their knowledge in new contexts, create new knowledge, where existing ways of doing and thinking are found wanting, and exercise wise judgment about what is important and what is not. Ovens (2009) argued that, link between knowledge and practice can be made by providing teachers with more in-service training opportunities. However, most studies illustrated that despite of changing demands on teachers, in-service training models offered to teachers are centralized, deeply institutionalized in patterns of organization, management and resource allocation (Altun, Yiğit, Özmen & Alev, 2007). Furthermore, there are many factors that affect teacher professional development, for instance, teacher motivations and change processes in teachers (Guskey, 2008).

In addition, teachers describe these one-shot workshops as boring and irrelevant, and they tend to forget 90% of what they have taught (Sandholtz, 2006). The literature indicates that the majority of teachers' continuous professional development (CPD) strategies for curriculum change implementation in the post-apartheid South Africa were inadequate to provide teachers with the necessary subject content matter knowledge, pedagogical skills and attitude to carry out their classroom responsibilities effectively (Ono & Ferreira, 2004). This study sought to develop a model for utilizing ICT to enhance teacher professional skill development for primary school teachers. This study was informed by data collected from primary schools in Tshwane South district. The collected data were validated in a framework that was conceptualized from two theoretical frameworks of; the Unified Theory of Acceptance and Use of Technology's (UTAUT); (Venkatesh, Morris, Davis & Davis, 2003) and the Theory of Planned Behaviour (TRA); (Ajzen & Fishbein, 1980, 2008). Both the Univariate and Bivariate analysis of data was conducted using the Statistical Package for Social Scientists v21.0.

## 3. Problem statement

Numerous challenges are identified in the literature for effective delivery of teacher professional development that ICT based INSET programmes may be able to address. Some of these challenges are the transfer of professional development of teaching practice, accessibility to specialized professional development in rural areas, and day-to-day professional support for teachers. A study by Bantwini (2009) shows some of the challenges of using face to face INSET programmes. The researcher further indicated that, the district designed and organised CPD in curriculum training for different subjects on the same days, which ran concurrently. The structure was described as ineffective, taking into consideration the context in that district. Many were teaching more than one subject, i.e. a teacher had to choose to attend one of the CPD programmes as Natural Sciences, Mathematics and Technology were offered at the same time. On the same note distance education

means are considered as parts of teacher professional development programs as they have some advantages of integrating them into INSET programs. Meyen, Ramp, Harrod and Bui (2003) summarize the possible advantages of ICT based staff development programmes as being self-paced, teacher-controlled, convenient to participate, personalized, allowing for public review, providing for portfolio management and enabling sharing of resources. When distance education means are used in the training of teachers, (Frey, 2008; Gunter, 2008) has observed positive effects both in teachers and in their learners. The gap identified by this paper was the lack of an ICT based model to enhance teachers' professional skill development.

## 4. RESEARCH QUESTIONS

The primary research question that informs this study was:

> ➢ How could a model for the utilization of ICT for teachers' professional skill development be developed?"

### 4.1. Secondary research questions

In order to answer the primary research question, the following secondary questions were answered:

1. What are the factors needed for the use of ICT based INSET programmes to enhance teacher professional skill development?
2. What is the role of ICT in influencing teacher professional skill development in primary schools?
3. What are the identified factors that could be use to develop a model for teachers, professional skill development in primary schools?

### 4.2. Specific objectives of the study

The specific objectives of this study were:

1. To determine the factors needed for the use of ICT based INSET programmes to enhance teacher professional skill development.
2. To investigate the role of ICT in influencing teachers' professional skill development in primary schools.
3. To use the identified factors to develop a model for teachers' professional skill development in primary schools.

## 5. Literature Review

### 5.1. Teacher professional development

According to the National Department of Education, professional development includes activities undertaken individually or collectively by teachers throughout their career to

enhance their professional knowledge, understanding, competence and leadership capacity. Development is intended to increase mastery of the curriculum and subject, skill in teaching and facilitating learning, understanding of children, young people and their developmental needs. Development is aimed at enhancing teachers' commitment in the best interests of their learners and their schools, the well-being of their communities and ethics of the teaching profession (DoE, 2011). Professional development is a comprehensive, sustained and intensive approach to improving teachers' and principals' effectiveness in raising learners' performance (Hirsh, 2009).

## 5.2. The role of teachers in curriculum reform

Curricular reforms are extremely demanding on teachers, and the nature of most curriculum reforms requires most teachers to make big changes to implement them well (Penuel, Fishman, Yamaguchi & Gallagher, 2007). There is an abundance of literature that discusses the role of the teachers and the influence they have on the success and failure of reforms in education. Without teachers' willingness, participation and cooperation, change in education is impossible. Hence, centrally initiated curriculum change will be of no value if it fails to engage the teachers as the key players or implementers to improve the student outcomes (Ono & Ferreira, 2004). In other words, the significant role that teachers play in curriculum reform must not be unnoticed if implementation is to be successful. Owston, Wideman, Murphy and Lupshenyuk (2008) similarly describes teachers as agents of change in education reform because they are able to greatly influence the end result.

Owsto et al. (2008) further emphasized that, teachers can be a powerful positive force for change, but only if they are given the resources and support which will enable them to carry out implementation effectively, otherwise the change is more likely to cause stress and disaffection with the change remaining as a pilot with certain schools rather than creating a renewed national system.  Ono and Ferreira (2004) agree that the success of any education policy depends on how the practitioners, namely the teachers, accept the mandated policy and adopt the desired practices. Teachers' openness and willingness to accept changes or their resistance to (or modification of) government policy could affect the implementation process and eventually determine the success or the failure of a new policy. As Garet et al. (2008) notes, "bureaucrats may give orders, but it is up to the individual teacher to implement those changes at the classroom level".

## 5.3. INSET programmes

In-service education is defined as "stresses the importance of the education authorities or education system in the presentation of in-service programmes" (Altun, Yiğit, Özmen & Alev, 2007).  They describe in-service training as a programme of systematised activities promoted or directed by the school system, or approved by the school system that contributes to the professional or occupational growth and competence of staff members during the time of their services to the school system. Researchers in the field also use another popular term called "professional development". Guskey (2008), define professional development, as all attempts made by educational leaders to enhance personal and professional growth of the staff. They refer to development as an "experiential involvement by an educator in a process of growing up – a continuous and never-ending developmental activity".  According to Garet, et al. (2008), professional development is all the means available for the teacher to become a better educated person, to develop judgements and skills, and to keep in touch with ideas and innovations in his or her own cognate fields through active participation in the planning and design of what is offered.

## 5.4. ICT based INSET programmes

According to Ginsburg, Gray, Levin and American Institutes for Research (2007) indicated that, traditional face-to-face professional development has some limitations, including being expensive and impractical to deliver in a face-to-face environment. Russell, Carey, Kleiman and Venable (2009), further indicated lack of capacity to change teachers' instructional practices in meaningful ways, not providing opportunity for practice, follow-up and reflection being irrelevant, ineffective and fractured and not giving teachers what they actually need to teach learners. (Marrero, Woodruff & Riccio, 2010). In comparison with traditional face-to-face professional development, ICT based professional development has many advantages. These include providing time and place flexibility for teachers, easier communication and interaction between teachers in different schools, enabling teachers to access PD courses at their convenience from where they live (Dede, Ketelhut, Whitehouse, Breit & McCloskey, 2009) and (Owston et al., 2008), providing self-paced programs (Olsen, 2010) and eliminating barriers faced by teachers who want to develop themselves. ICT based professional development techniques have therefore become more common for in-service education and training (INSET) of teachers.

## 5.5. Factors affecting the adoption of ICT in distance online for teacher professional development

The literature has identified several factors which can impact the effectiveness of ICT training courses when assigned for teachers including: individual differences among teachers, school culture and teacher interaction, and follow-up and ongoing support provided to teachers when they try to implement their newly developed skills. Teachers' attitude towards the use if ICT will also be investigated in this paper.

### 5.5.1 Individual differences among teachers

ICT professional development courses should consider the fact that teachers are widely divergent regarding their knowledge about ICT (Meyen et al., 2003). Such consideration can prevent programs from being frustrating for teachers with little or no experience in using ICT, and at the same time they avoid being disappointing for other teachers with better ICT knowledge and skills.

### 5.5.2 School culture and teacher interaction

Apparently, the self-contained culture of schools is not aligned with the emerging aspects and skills of the knowledge-based economy such as collaboration, teamwork and communication. Increasingly, the world is more dynamic and in such an environment neither teachers nor schools can perform effectively in their traditional isolation. According to Fiszer (2004) "isolation is the enemy of improvement when the practitioner must be ready to meet constantly changing student needs". Moreover, the literature stresses the need for teachers to share experiences with each other in order to best learn how to integrate ICT in pedagogy. As Olsen (2010) puts it, schools have the potential to be learning places for teachers too, providing that the culture of schools is reshaped to facilitate this.

### 5.5.3 Follow-up and ongoing support

Pre-service education is not sufficient for teachers to be able to handle their job for the rest of their lives; rather, they require ongoing professional development and support. In the information age, where innovations are constantly introduced and change is happening

rapidly, the demand for ongoing professional development is in high priority (World Bank, 2002). Furthermore, it might be relatively straightforward to present professional development programs, but a greater challenge arises when teachers try to implement what they learn in real classrooms. Olsen (2010) suggests that teachers might abandon new practices while they are in the early stages of implementation because of lack of assistance.

### 5.5.3  Teacher attitude

Research has shown that teachers' attitudes towards technology influence their acceptance of the usefulness of technology and its integration into teaching, (Huang & Liaw, 2005). In European Schoolnet (2010) survey on teachers' use of Acer netbooks involving six European Union countries, a large number of participants believed that the use of netbook had had positive impact on their learning, promoted individualized learning and helped to lengthen study beyond school day. A survey of UK teachers also revealed that teachers' positivity about the possible contributions of ICT was moderated as they became 'rather more ambivalent and sometimes doubtful' about 'specific, current advantages', Becta (2008). Teachers' computer experience relates positively to their computer attitudes. The more experience teachers have with computers, the more likely that they will show positive attitudes towards computers (Rozell & Gardner, 1999). The aim of this is investigate the teachers' towards the use  of ICT based INSET programmes, the Theory of Planned (TPB) behaviour was therefore used as a lens to measure teacher attitude. TPB together with The use of integrated the Unified Theory of Acceptance and Use of Technology (UTAUT) will be discussed in the next section of this paper.

## 6.  THEORETICAL FRAMEWORK AND THE RESEARCH MODEL

This paper aims at investigating factors that motivate and/or demotivate teachers in disadvantaged areas or those who are unable to attend face to face INSET programmes to use ICT based INSET programmes. The use of integrated the UTAUT and TPB were deemed the most applicable theories to answer the research questions. The above two theoretical frameworks will strengthen each other when assessing how a model for ICT based INSET programs will enhance teacher professional skill development in primary schools in Tshwane South district can be developed. Figure 1 shows the conceptual framework, the constructs and hypothesized links in the model and the direction of the hypothesized relationships among the constructs.
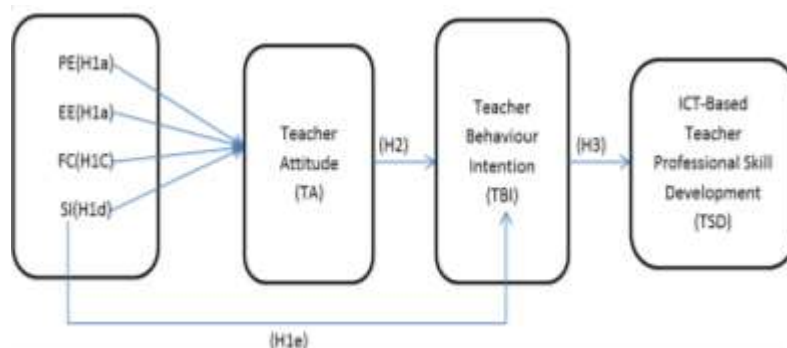


**Figure    1:**

**Conceptual framework with propositions**

From UTAUT all the four constructs, performance expectancy, effort expectancy facilitating conditions and social influence were adopted. Effort expectancy is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003). Social influence is defined as "the degree to which an individual perceives that (other important people) believe he or she should use the new system". Facilitation conditions are defined as "the degree to which an individual believes that their schools and the Department of Education will be able to provide them with resources, i.e. laptops, iPads and internet connection access.  As for

TPB only two constructs were selected, namely attitude and behavioural intention. BI is the immediate antecedent of behaviour based on the attitude toward behaviour, subjective norm and perceived behavioural control (Ajzen & Fishbein, 1980, 2008). Teacher's intention to use ICT will in most cases lead to actual usage. This is in most cases true if the teacher's behaviour is under free will (Ajzen & Fishbein, 2005). Other researchers Venkatesh and Morris (2000); Venkatesh et al. (2003) also put it that the relationship between BI and usage is really significant. The model defines six hypotheses that were formulated to test each path in the conceptual model.

### 6.1. Hypothesis Development

Based on the theoretical model presented in Figure 1, a number of hypotheses are developed and then empirically tested. The section below summarizes the research hypotheses for this study:

H1a: Performance Expectance (PE) when mediated by teacher attitude will influence ICT usage for professional skill development.

H1b: Effort Expectance (EE) when mediated by teacher attitude knowledge-sharing, intention will influence ICT usage for professional skill development.

H1c: Facilitating Conditions (FC) when mediated by teacher attitude knowledge-sharing intention will influence ICT usage for professional skill development.

H1d: Social Influence (SI) directly influences teacher behavior intention for ICT usage for professional skill development.

H2: Teacher attitude (TA) directly influences teacher behavior intention for ICT usage for professional skill development.

H3: Teacher behavior intention (TBI) directly influences ICT usage for professional skill development.

## 7. METHODOLOGY

### 7.1. Design

The study incorporated a cross-sectional design with participants completing a paper-and-pencil self-report survey. By using constructs in the conceptual framework, a close-ended questionnaire was developed based on a 5 point-Likert scale where 5 and 1 represented strongly agree and strongly disagree respectively, 3 represented neutral whereas 4 and 2 were respective intermediate values. The researchers used a survey to explore the teacher attitudes toward change as well as the factors that affect teachers' resistance to change.

Several steps were followed to develop this instrument. First, after an extensive literature review, lists of the most common factors that affect teachers' acceptance and use of technology were identified. UTAUT was adopted to investigate teachers' acceptance for the use of technology. Then, such factors were organized into four categories: effort expectance, performance acceptance, facilitating conditions and social influence. TPB was adopted to measure attitude towards the use of ICT to enhance teacher professional skill development. TPB constructs were organized into four categories: teacher attitude and behavior intention. A total of 28 statements of closed-ended statements targeting these four factors were developed. Responses were noted on a 5-points Likert scale ranging from strongly disagree (1) to strongly agree (5). The participants were selected randomly. Further still, this study followed a non-probability judgment sampling whereby the selected participants

conformed to some criterion. The main aim of this paper was to investigate factors that are likely to motivate teachers to use ICT based INSET programmes to enhance their professional skill development. The study targeted primary school teachers, because they were key players involved in the teaching of the new school curriculum, hence they were core subjects in this study. Twelve (12) primary schools were purposively selected for this study. One hundred and twenty (120) were then distributed to selected primary schools in Tshwane North district. Of these, 102 were returned giving a response rate of 93.2%. This response rate was considered high enough, the 102 returned questionnaires were transcribed in SPSS for analysis. However, only 82 were found usable as others were discarded due to missing data.

Then, the instrument was pilot tested by asking ten randomly selected teachers from one of the government schools which was not part of the main study to complete the instrument. Some modifications were made based on teachers' feedback. Finally, after data collection, the instrument was checked for reliability by using Cronbach's alpha. There were seven constructs as per conceptual framework. Most of the constructs are above the minimum α coefficient of 0.7 with the exception of performance expectance construct which is below the minimum required α coefficient value of 0.7. Table I shows the reliability test of the constructs.

**Table I: Cronbach's alpha reliability of results**

| Construct | Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|---|
| Performance expectance (PE) | 0.638 | 0.643 | 4 |
| Effort expectance (EE) | 0.780 | 0.784 | 4 |
| Facilitating condition s (FC) | 0.751 | 0.736 | 4 |
| Social influence (SI) | 0.791 | 0.784 | 4 |
| Teacher attitude (TA) | 0.833 | 0.844 | 4 |
| Behaviour intention (TBI) | 0.708 | 0.709 | 4 |
| ICT-based teachers skill development (TSD) | 0.801 | 0.803 | 4 |

## 8. DISCUSSION OF THE FINDINGS

Polit and Hungler (2006) refer to reliability as the degree of consistency with which an instrument measures the attribute it is designed to measure. After the reliability tests, the collected data was analyzed to check how each construct correlates with other constructs.

### 8.1. Correlation

Correlation analysis describes the strength and direction of the linear relationship between two variables (Robila, 2006). Table II shows that effort expectance (EE) significantly correlates with performance expectance (PE) with Pearson correlations of 0.631** at a 0.01 level. Facilitating conditions (FC) was significant with both facilitating conditions (FC) and effort expectance (EE) with a Pearson's correlation of 0.224** and 0.335** respectively at a 0.01 level. Social influence (SI) was also significant with both effort expectance and performance expectance (PE) with a Pearson's correlation of 0.282** and 0.462** respectively at a 0.01 level, while it was insignificant with facilitating conditions (FC). Facilitating conditions (FC) and performance expectance (PE) was insignificant with teacher attitude (TA) whilst it significantly correlates with performance expectance (PE) and effort expectance with Pearson correlations of -0.320** and -0.245** respectively at a 0.01 level.

Both performance expectance (PE) effort expectance (EE) and teacher attitude (TA) significantly correlates with teacher behavior intention (TBI) with Pearson correlations of -0.333**, -0.271* and 0.686** at a 0.01 level, whilst with Social influence (SI) with performance expectance (PE) was insignificant. Teacher skill development (TSD) was also significant with

both performance expectance (PE), effort expectance (EE), social influence (SI) and teacher's attitude (TA) with a Pearson's correlation of 0.181, 0.231**, 0.096*, 0.204** and 0.207** respectively at a 0.05 and 0.01 level.

**Table II: Correlation of constructs.**

| | | PE | EE | FC | SI | TA | TBI | TSD |
|---|---|---|---|---|---|---|---|---|
| PE | Pearson Correlation | 1 | | | | | | |
| EE | Pearson Correlation | .631** | 1 | | | | | |
| FC | Pearson Correlation | .224** | .335** | 1 | | | | |
| SI | Pearson Correlation | .149** | .126** | .092 | 1 | | | |
| TA | Pearson Correlation | -.320** | -.245** | .008 | .028 | 1 | | |
| TBI | Pearson Correlation | -.333** | -.271** | -.059 | .003 | .686** | 1 | |
| TSD | Pearson Correlation | .181** | .141** | .231** | .096* | .204** | .207** | 1 |

** $p < 0.01$; * $p < 0.05$

## 8.2. Regression

Regression analysis is a technique used to model and analyses a number of constructs to determine the relationship between a dependent variable and one or more independent variables (Pallant, 2008). Results indicated that the model has a good predicting power of using ICT based INSET programmes to enhance teacher professional skill development. As demonstrated by Table III, the overall prediction of the model (R square) is 86.9%.

**Table III: Model summary**

| 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 | .780ª | .609 | .659 | .421 | .869 | 6.292 | 56 | 83 | .000 |

a. Predictors: (Constant), PE, EE, FC, SI, TA, TBI

b. Dependent Variable: ICT usage for TSD

According to Pallant (2008), the independent constructs' contribution to the overall prediction of the dependent variable is significant if their critical ratio (t-value) is greater or equal to ±1.96. Hence, using this basis, results revealed that performance expectance (PE), contributes higher (29.4%) to the overall prediction of the use of ICT based INSET programmes to enhance teacher professional skill development. This was followed by effort expectance (EE) with a contribution of 24.7%. Other constructs like; social influence (SI), teacher attitude (TA) and facilitating conditions (FC) were also found to have significant contributions of 22.4%,18.7% and 16.7% respectively. Whilst teacher behavior intention (TBI) has the least contribution of 5.6%.

**Table IV. Multiple regression coefficients for teacher professional skill development**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | 2.887 | .487 | | 5.930 | .000 | | |
| PE | -.354 | .068 | -.294 | -5.190 | .000 | .863 | 1.159 |
| EE | -.192 | .056 | -.247 | -3.409 | .001 | .526 | 1.901 |
| SI | .160 | .052 | -.224 | -3.063 | .003 | .519 | 1.928 |
| FC | -.152 | .069 | -167 | -2.194 | .030 | .481 | 2.081 |
| TA | .140 | .066 | .187 | 2.134 | .035 | .362 | 1.296 |
| TBI | -.037 | .053 | -.056 | -684 | .495 | .417 | 2.398 |
| ICTUsage | .171 | .059 | .174 | 2.904 | .004 | .772 | 1.296 |

a.         Dependent Variable: ICT usage for TSD

## 9. Hypotheses

Hypothesis testing helps in deciding whether the suggested effects actually occurred; the given treatments have effects; the conceptual framework's constructs differ from each other and whether one constructs predicts the other. This study suggested six hypotheses that were discussed in section 6.1. Table V shows the extracts of the results of the tested hypotheses showing their significance at p<0.05 and p<0.01 respectively.

**Table V: Hypotheses Testing**

| Construct | Hypothesis | (P value) | Action |
|---|---|---|---|
| Performance Expectance (PE) | H1a: Performance expectance when mediated by teacher attitude knowledge sharing intention will influence ICT usage for teacher professional development. | P = 0.007 < 0.05 | Accepted |
| Effort Expectance (EE) | H1b: Effort expectance when mediated by teacher attitude knowledge sharing intention will influence ICT usage for teacher professional development. | P = 0.062 < 0.05 | Rejected |
| Facilitating Conditions (FC) | H1c: Facilitating conditions when mediated by teacher attitude knowledge sharing intention will influence ICT usage for teacher professional development. | P = 0.005 < 0.05 | Accepted |
| Social Influence (SI) | H1d: Social influence when mediated by teacher attitude knowledge sharing intention will influence ICT usage for teacher professional development. | P = 0.436 < 0.05 | Rejected |
| Teacher Attitude (TA) | H2: Teacher attitude directly influence ICT usage for teacher professional development. | P = 0.008 < 0.05 | Accepted |
| Teacher Behaviour Intention (TBI) | H3: Teacher behaviour directly influence ICT usage for teacher professional development. | P = 0.001 < 0.05 | Accepted |

*** p < 0.001; ** p < 0.01; * p < 0.05

## 10. Discussion and implication in relation to the research goal

The goal of the study was to develop a framework for teacher professional skill development. The conceptual model in Figure 1 was developed based on the identified constructs. From the obtained results in Table III, the following hypotheses were found to be significant to develop a framework that would enhance teacher professional skill development. Figure 2 demonstrates the graphical representation of the model displaying constructs that are needed for the development of the model.
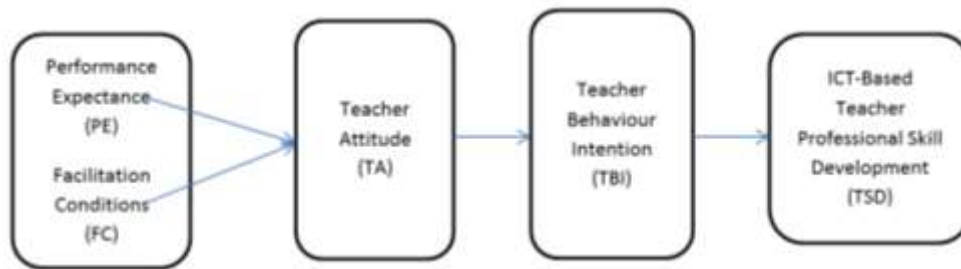
**Figure 2: Teacher professional skill development model**

Four hypotheses out of 6 were supported. From the final model, this paper propose that effort expectance and facilitating condition may influence attitude which in turn will also influence teacher behaviour intention to use ICT based INSET programmes . The results revealed behaviour intention has a direct effect on the use of ICT based INSET programmes. Those hypotheses that were insignificant were identified and deleted from the final model.

## 10.   CONCLUSION

Based on the findings, performance expectancy had the highest significant positive influence on the use of ICT based INSET programmes to enhance teacher professional skill development. This conforms to the previous study by Venkatesh et al. (2003) which also found the similar result on performance expectancy. Facilitating conditions were found to have a positive and significant influence on the use of ICT based INSET programmes, although it has a lower magnitude of influence than performance expectancy and effort expectancy. Similar findings also suggested by Becta (2008), who indicated that, if teachers cannot access ICT resources, then they will not use them. The present study also found that, teacher attitude as well as behaviour intention has a positive and significant influence on teachers' use of ICT based INSET programmes. These findings are also consistent with Ono and Ferreira, (2004) who indicated that, without teachers' willingness, participation and cooperation, change in education is impossible. Hence, centrally initiated curriculum change will be of no value if it fails to engage the teachers as the key players or implementers to improve the learner outcomes.  Teachers' perception on the on use of ICT based INSET programmes is greatly enhanced by providing time and place flexibility for teachers, easier communication and interaction between teachers in different schools, enabling teachers to access professional development courses/programmes at their convenience from where they live and also providing self-paced programmes.  Therefore, if teachers perceive that an innovation has an advantage over the existing technology, compatible with their social needs, ease to adopt, it can be tried before use and finally the results can been seen, it is likely that teachers will adopt and integrate it quickly.

Consequently, the researcher expected a strong relationship between performance expectance, effort expectance and teacher attitude towards the use of ICT based INSET programmes. The results shows that influence of performance  expectance  towards teachers' use of ICT based INSET programmes  in this study is consistent with Venkatesh et al. (2003) and Al-Gahtani et al. (2007) who indicated that, there is a positive significant effect between performance expectance and  attitude towards use. The result also show that, performance expectance, effort expectance and teacher attitude (TA) significantly correlates with teacher behavior intention construct correlates with performance expectance, effort expectance as well as and teachers' attitude towards the use of ICT based INSET programmes. The result also shows that teachers' professional skill development construct is correlated with performance expectance, effort expectance and teacher's attitude towards the use of ICT based INSET programmes. The insignificant influence of facilitating conditions,

performance expectance with teacher attitude might be caused by the respondent's beliefs about the value of using technology to deliver INSET programmes.

## 11. LIMITATION AND RECOMMENDATIONS

The first limitation concerns generalizability of the findings. This study was conducted in primary schools in Tshwane South district,  which is one of  the six districts that falls under Tshwane South.This study recommends a comparative analysis or a replication of the study in other provinces to enable better generalizability of the findings. Also, the survey instrument relied on self-reported measures, in which the findings were dependent upon the teachers' responses regarding the use of ICT based INSET programmes to enhance their professional skill development rather than on direct observation of such behavior. Much as before collection of data participants were requested to be as honest as possible, self-reports of behavior are often criticized as being tainted with response bias and inaccuracies. Hence, such may lead to poor indicators of actual behavior. Future studies should also correct data using other methods like interviews and observations. Furthermore future research should identify other relevant factors that may help increase the use of ICT based INSET programs to enhance teachers professional skill development.

It is recommended that, ICT based INSET programs must be relevant for teachers' classroom activities and INSET activities must indicate the examples of how computer use and the internet are integrated into teachers' daily classroom activities. The active participation of the INSET participants should be provided through implementing various instructional activities during these programs and topics studied during these programs need to be related to teachers' school curricula and their subject areas.

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