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The discourse on ICT teacher professional development needs: The case of a South African teachers' union

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ABSTRACT

The prevalence and adoption of Information and Communication Technology (ICT) tools in education has often been guided by utopian perspectives without proper research to understand the schooling context and teachers' ICT development needs. This paper reports on the findings from a study of in-service teachers who are members of a teachers' union in South Africa. These teachers were surveyed using a questionnaire based on Second Information Technology in Education Study (SITES), which is an analytic framework that includes teacher characteristics, pedagogical practices and ICT use, school factors and system, and other external factors. This exploratory study was conducted within the framework of a teachers' union to understand members' preparedness to integrate ICT tools in their teaching practices. Findings indicate the need for in-service professional development activities in the use of ICT for teaching, in teaching in multicultural environments, and in classroom management. Equally important is the role of school management and administration in the adoption and integration of ICT tools in education. In addition, the research provided clear evidence that despite the huge investments into ICT infrastructure by government, inequalities in ICT competencies among teachers remain. The most important conclusion is that the investments being made are politically motivated and that teachers are being side-lined in the decision-making processes and preference given to political visions.

Keywords: *ICT Teacher Professional Development; Curriculum Teacher Professional Development; CPD*

INTRODUCTION

The proliferation of Information and Communication Technologies (ICT) demands improved quality of teaching and learning in education to improve learner attainment. ICT offers greater opportunities to access learning, redress inequalities, and improve the quality of teaching and learning (White Paper on e-Education, 2004). However, teachers' ICT professional development needs are not addressed in a meaningful and systematic way despite the demand for teachers to develop ICT skills and competencies. According to Kalogiannakis (2010) ICT "changes fundamentally the teachers' role…The use of ICT is becoming a part of everyday life in schools" (p. 4). Therefore, the Republic of South Africa needs to determine the kind of ICT professional development interventions that are most effective for improving teaching and learning using ICT. Fullan (1991) pointed out 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). In our view, to change education and improve core activities in the educational setting through ICT, the implementation must be accompanied by meaningful and effective ICT teacher development activities. These activities in turn help teachers develop digital fluency and pedagogies. In the current situation, the diffusion of ICT gadgets represents "discrepancies between the conceptions and ideas of what it is possible to achieve with digital technology in schools" (Olofsson, Lindberg, Fransson, & Hauge, 2011, p. 212).

Fullan (2006) predicts that unless professional development activities "motivate people to put in the effort—individually and collectively—that is necessary to get results, improvement is not possible" (p. 8). Clearly there should be no "discrepancy between the arenas for formulation and the arenas of realization" (Olofsson et al., 2011, p. 212). Political ambitions should be in line with the educational goals and actual practices in the schools along with structural parameters that are enabling the promotion of educational change and ICT integration into teaching and learning. According to Dall'Alba and Sandberg (2006) "professional development in the workplace may be organized in the form of structured activities or courses with the purpose of enhancing professional skill, keeping a group of professionals' up-to-date or supporting change in the organization" (p. 384). Carlson and Gadio (2002) asserted that:

> Experience around the world in developing, industrialised, and information-based countries has shown that teacher training in the use and application of technology is the key determining factor for improved student performance (in terms of both knowledge acquisition and skills development enabled by technology). (p. 119)

Olakulehin (2007) noted that of all the educational problems on the African continent there is none as persistent and compelling as teacher training or development. South Africa has invested massively in ICT in education; however, the country is still grappling with issues of professional teacher development in ICT. According to UNESCO (2003, p. 118), spending scarce resources on ICT without financing teacher development is wasteful. Furthermore, ICT teacher development is one of the contributing factors in using ICT effectively in class. This indicates a pressing need for ICT professional development for teachers in schools beyond the documentation of existing practices, national ICT policies, and frameworks.

In as much as there is an urgent need for ICT professional development in schools, literature tends to criticise the existing ICT professional development for being ineffective. UNESCO (2003) argues that ineffective ICT professional development emanates from the lack of teacher support in the classroom. A further argument is made that during ICT training teachers learn different strategies to integrate ICT, however, employing those strategies in the classroom is more difficult than learning the strategies itself. This is attributed to unrealistic expectations and rhetoric that somehow the presence of ICT leads to enhanced learning and transformation of education. Literature shows deficiencies in the ICT professional development that result in an ineffective ICT integration in teaching and learning environment. Kalogiannakis (2008) argues that most "ICT training lack attention to the context in which teachers work" (p. 14). ICT professional developments are costly and vary in design. As De Clercq and Shalem (2014) note:

> Professional development differs in the form in which teacher learning is organised, duration and pacing of teacher learning, the types of resource material and artefacts selected to engage teachers in the learning process, the site of learning and participants selection criteria. Professional developments have different foci which refer to the content of the programme. (p. 153)

Kalogiannakis (2008) and De Clercq and Shalem (2014) emphasise the importance of understanding the context that teachers work in. The differences in the design of professional development create inequalities within the ICT professional development sector and promote ineffective use of ICT in teaching and learning. ICT professional developments are criticised for lack of consistency and coherence. One shop or one-shot workshops often do not change teacher practice (Guskey, 2002). Teachers need to be engaged in an ongoing process of ICT professional development. UNESCO (2003) advocates for professional development as a process that will capacitate frontline users, mainly teachers, to gradually become experts in their practice, as opposed to a once of course or workshop. Guskey (2002, p. 388) maintains that professional development should not be seen as an event but a process or "ongoing endeavour". The main aim for teacher professional development in ICT is to improve classroom practice and therefore improve learners' achievement. The main viewpoint guiding this work is that meaningful

and systematic ICT professional development activities are needed to help teachers develop skills and competencies and in the process develop pedagogical innovation and confidence in ICT adoption and integration. There are two questions to be addressed in the article:

1. To what extent are current professional development activities enabling or constraining teachers from dealing with ICT classroom practices?
2. What are the general views of educators on current professional development activities?

The ubiquity of new technologies and their potential benefits in education are well documented, however, identifying and understanding teachers' ICT professional needs and barriers to ICT adoption and integration is an important step. A study that was conducted in Jordan indicated that ICT professional development processes in place assisted teachers to improve their skills and knowledge and also emphasised the need for teachers to be trained and retrained (Abuhmaid, 2011). This article contributes to the understanding of teachers' ICT competencies gaps and the need for meaningful and systematic professional development activities. This will assist in the alleviation of the difficulties encountered by teachers in the integration process to improve the quality of teaching and learning.

UNDERSTANDING THE CONTEXT

In South Africa, a significant amount of funds has been made available to equip schools with ICT infrastructure, but the level of up take is still very low among teachers. Schools are falling short of professional development activities required for teachers to develop their digital fluency in order to adopt and integrate technology in the classrooms. Both in-service and pre-service teachers are facing a reality of new emerging ICT tools and devices and the daunting task of integrating them into their classrooms. DeSantis (2012) reports that schools were investing in interactive whiteboards (IWB) without adequate training. In South Africa, the procurement of computing devices is outpacing teacher training, and yet, these devices are, as Cuban (2009 p. 179) notes, "oversold and underused". According to Buckenmeyer (2010), "the challenge is not getting appropriate technology into classrooms, but getting those in classrooms prepared to use those technologies, and facilitating greater willingness to incorporate changing technologies as they emerge" (p. 27). The incorporation of ICT should be considered an "obligatory modernization of learning and teaching methods" (Kalogiannakis, 2010, p. 5). However, ICT investments or flow of funds must always connect with educational needs instead of allowing service providers or vendors to regulate ICT investment and use in schools. Moreover, care must be taken to ensure that political ambitions do not drive the process, and the structural and cultural aspects of the school must be recognised in order to create a more holistic approach for the integration of ICT.

The article posits that schools need to develop processes and school-wide policies to support any investments on new ICT tools for teaching. Studies from all over the world have shown that ICT tools open up exciting and innovative instructional techniques that may be used to overcome student passiveness and enhance critical thinking skills (Tan, 2012; Laxman, 2010; Chiu, 2009; Yang & Chou, 2008). A significant number of teachers who participated in the study expressed their displeasure at the lack of access to computing infrastructure, connectivity and ICT professional development activities that facilitate the development of skills and confidence. Through the lens of Bourdieu (1986) on Social Capital Theory we conclude that ICT adoption and integration are influenced by the perceived level of scaffolding and the level of commitment by government to ICT development activities for teachers in order to create professional learning communities. In the current situation vendors tend to regulate the ICT environment; thus, there is no correlation between the huge ICT investments being made by government and the uptake of ICT in schools. Vendors act as social agents in constructing an unrealistic social reality in the country which indicates the gap between what is possible and the ICT competencies of teachers.

THE NEED FOR MEANINGFUL AND SYSTEMATIC ICT PROFESSIONAL DEVELOPMENT ACTIVITIES

There is a growing consensus in literature that ICT professional developments provide teachers with basic computer skills, yet they are expected to integrate ICT effectively into their teaching and learning. UNESCO (2004) maintains that teachers need training not only in computer literacy but also in the pedagogical application of those skills to teaching and learning. On the same note, Ertmer (1999) emphasises that teachers need to access multiple types of training where ICT pedagogy needs are addressed. This enables teachers to shift their pedagogical practices to improve their classroom practice. The effective use of ICT in learning is dependent on the teachers' ability to use and understand the pedagogy of using ICT as a learning tool. De Clercq and Shalem (2014) explain that to teach well, teachers need a particular knowledge of what they teach, a broad sense of diverse methods of teaching, and, more specifically, ways of explaining and representing the specific content they teach.

ICT professional development should not be treated in isolation. As Guskey (1994) argues, professional development should be integrated into the existing educational framework. This means that professional development should not be placed on the side-line, but be interwoven into the existing educational frameworks. Moreover, professional development is a significant element in promoting change in the education system and it should be seen as a primary vehicle to drive change in an institution. Professional development that is designed to facilitate change should be teacher specific and focus on the day-to-day activities at the classroom level (MacLaughlin, 1990; Weatherly & Lipsky, 1997 cited in Guskey, 1994). Other scholars argue that ICT professional development should be carried out by individual teachers and should be school-based learning. De Clercq and Shalem (2014) note that there is a debate on whether school focused learning can make a substantial difference in teachers' learning and, if so, to what extent. Maistry (2008) presents a different view and argues that ICT professional development should be personalised and responsive to the complex and unique needs and context of the learner.

Professional ICT developments that are general to all subjects, also called 'one size fit all', are being widely criticised. Binglimas (2009), Unwin (2005) and Hennessy, Harrison and Wamakote (2010) argue that professional development should be tailored in as far as possible to a subject discipline. This will allow teachers to deepen their ICT pedagogical skills and share common practices within their discipline. Guskey and Yoon (2009) note that collaboration between teachers, who have a clear understanding of critical issues in the subject discipline, and district level personnel, who have a broader perspective on the problems related to the discipline, seems essential to optimise effective professional development.

In professional development, teacher learning is as important as learners' learning. Welch (2012) argues that "if professional development is not centred on the link between educators' skills and knowledge and student learning, it cannot be said to be working"(p. 2). It is noted that effective ICT professional development should be linked to teacher learning and learners' achievements; however, there is scant literature explaining how to measure the impact of ICT professional development in ICT pedagogical integration and student achievement. The literature points out that ICT professional development needs to change teachers' beliefs and attitudes about ICT in order for them to integrate ICT into education. Guskey (2002) argues that professional development should be a systematic effort to bring about change in the classroom practice and their beliefs and attitudes. Professional development is seen as a crucial component that coordinates teachers' ICT skills with the pervasive use of technology. What attracts teachers to professional development is their belief that it will work and it will attribute to their growth (2002). Guskey (2002) explains that teachers' beliefs and attitude do not change before the classroom practice but after seeing the effectiveness of the practice through learners' achievements. In other words, teachers are more likely to participate in professional development that will have a direct

impact on the everyday activities in the classroom. Furthermore, Guskey (2002) stresses that successful implementation changes teacher beliefs and attitudes however, change informed by learners performance. Change is mainly an experientially based learning process for teachers.

THEORETICAL FRAMEWORK

Based on Social Capital Theory, we speculate that ICT adoption and integration is influenced by the perceived level of scaffolding and the government's government to teachers' technology development (Albion, 2008; Schlager & Fusco, 2003; Marx, Blumenfeld, Krajcik, & Soloway, 1998). This theory was conceptualised in terms of social networks and access to cognitive capital (Nahapiet & Ghoshal, 2000; Chiu, Hsu, & Wang, 2006). According to Nahapiet and Ghoshal (2000) social capital "facilitates the creation of new intellectual capital" (p. 119). Bourdieu (1986) explains social capital as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition or in other words, to membership in a group" (p. 248). He argues that group membership provides those in the group with a 'credential' that acts as a sort of credit from which they can draw. Therefore, lack of access to social capital affects information and knowledge access. Bourdieu defined social capital as "The sum of resources, actual or virtual, that accrues to an individual or a group by virtue of possessing a durable network of more or less institutionalised relationships of mutual acquaintance and recognition" (Bourdieu, 1977, p. 503).

In this case, teachers must have access to ICT knowledge as it will enable them to participate in the information age era. It will also allow collaboration and connections among educators and encourage the development of ICT knowledge among themselves. However, the collaborations and connections will depend on social interactions, which in turn has a significant effect on resource sharing (Tsai & Ghoshal, 1998). Thus, it is imperative that teachers have access to new ICT knowledge available from members of a network. The role of capital in a social world is critical (Bourdieu, 1980). In this case, we decided to continue this discourse through the lens of the Social Capital Theory. From a Social Capital perspective, transmission of knowledge is not enough but high quality professional development activities are central to bridging the gap to access and the development of knowledge (Levin & Cross, 2004).

Through high quality professional development activities teachers could expand their computing abilities, bring about change in their classroom practices, and improve learning outcomes of learners. Benefits that can be derived from a social system include support, resources, a durable network, and acquaintances in multiple networks that are hierarchically flatter and more recursive (Koku & Wellman, 2004). These benefits are central to the Social Capital Theory's assertion that constitutes of networks are made up of sets of the relations. The reality in South Africa is that most teachers were previously disadvantaged by apartheid policies, which resulted in fewer resources to help them develop meaningful ICT skills. Therefore, the current professional development activities must not contribute to a culture that widen the access gap. However, effective ICT professional development should enable the expansion of social networks and strengthen institutional interactions and pedagogical ties by generating social capital.

RESEARCH METHODOLOGICAL APPROACH

This article was part of a study that included 986 teachers and aimed to establish educators' perspectives of ICT, attitudes towards ICT integration, ICT skills, ICT usage experience, intentions to use ICT in teaching and learning, and understanding of curriculum issues. The 986 teachers were selected from various regions of the union reflecting the profile of the nine South African provinces. A structured questionnaire was developed, and all constructs of the instrument

were based on SITES: An analytic framework that includes teacher characteristics, pedagogical practices and ICT use, school factors and system, and other external factors. This exploratory study was conducted within the framework of a teachers union to understand their members' preparedness to integrate ICT tools into their teaching practices. Various scales, including the Likert scale, were used to enhance the validity of the measures (Mpinganjira, 2016). Regional conveners of the union were trained to fill in the questionnaires, and they then distributed the questionnaire to their members according to regions. This exercise yielded 986 usable questionnaires. We studied the experiences of 986 teachers within the union as the uptake of ICT in schools continues to be slow. The quantitative approach allows easy collection of data within a large group. The researchers then proceeded to quantitatively analyse the data to interpret the teachers' experiences and understand some of the curriculum issues creating barriers in their profession. A purposive sampling technique, which is a nonprobability sampling method (Creswell, 2000), was used given that we did not have access to a list of participants from which to draw a random sample. After collecting the data, it was coded to perform statistical analysis. The data analysis consisted of two phases: Phase 1 was statistical analysis and Phase 2 was the interpretation of the data to understand general views of educators about current professional development activities. In addition, we interpreted the correlations to understand whether the current professional development activities are enabling or inaccessible to teachers.

PRESENTATION OF THE RESULTS

The sample showed that 40.7% of the respondents were male and 59.3% were female. Participants were racially distributed as follows: 73% Africans, 23.6% Coloured, 2.3% Indians, 0.6% Whites, and 0.4% other. Of the 986 participants, 15.8% were from urban areas, 30.2% were from rural areas, 7.8% were from semi-urban areas, while 38.7% were from the townships; 7.6% opted not to select their location. Lack of access to continuous professional development (CPD) activities was one of the issues raised by teachers: 80% of teachers who participated in the project expressed the need for professional development in ICT and teaching in multicultural environments; 81% expressed the need for professional development activities in teaching special needs learners; and 73% expressed the need for professional development activities in diverse learners' issues. These issues range from learners' discipline and student counselling to behavioural problems. The results show that 71% of the participants expressed the need for professional development in school management and administration; 63% expressed the need for professional development in student assessment practices; and 50% expressed their desire to access professional development activities in classroom management.

The participating teachers expressed their desire to participate in professional development activities, however, the following factors, shown in Figure 1, prevented them: The programmes are too expensive, lack of support from employers, programmes not prerequisite for their work, family responsibilities, and scheduling conflicts. Despite all these factors, 91% of teachers participated in courses or workshops; 52% participated in conferences and seminars; 47% participated in qualification programmes; 39% participated in postgraduate programmes; and 44% participated in certification programmes.

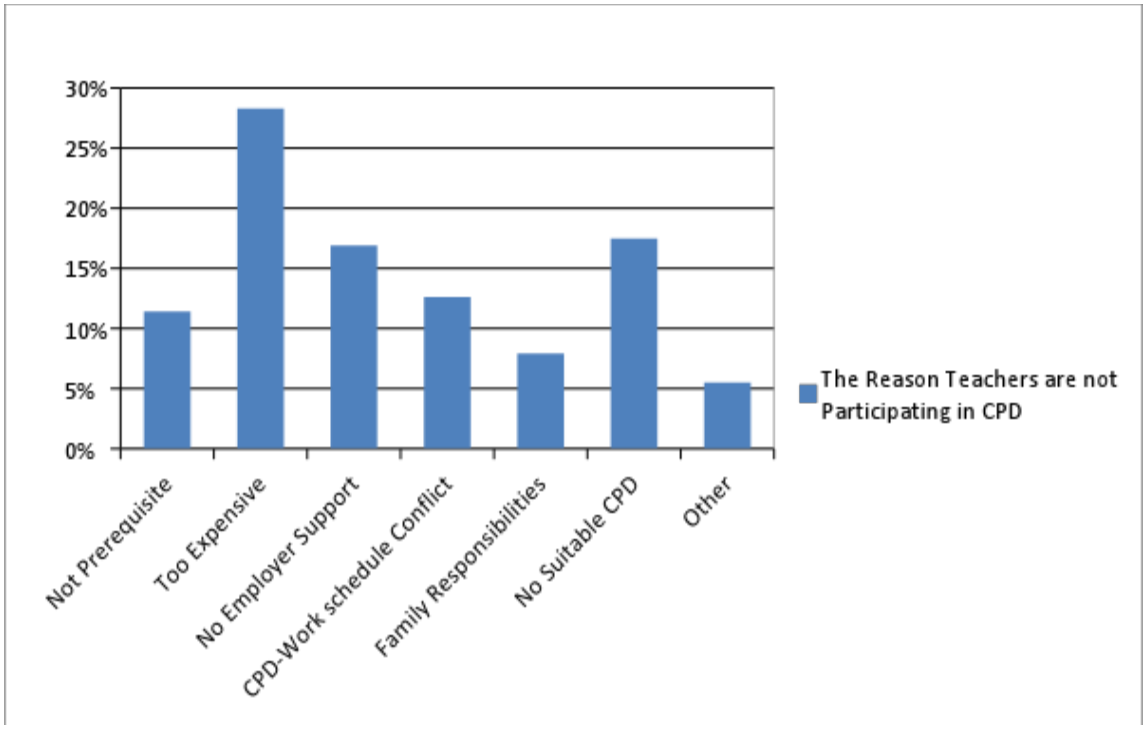

***Figure 1**: Factors Preventing Teachers from Participating in CPD*

When teachers' ICT professional development needs are understood, initiatives or interventions can be created to support teachers. Teachers participating in the study raised the issue of appraisals: 40% say they never receive any type of feedback or appraisal on their performance. The need for appraisal also pointed at senior management teams not giving any type of feedback. The teachers expressed the importance of such activities in their professional growth and the impact it has on their performance. The impact of appraisal escalated to their teaching practices in order to improve learners' attainment. Continuous affordable professional activities would enable teachers to access relevant knowledge for their professional growth and in the process increase their confidence. Of the teachers who participated, 52% expressed the need for professional development in content knowledge and performance standards in the teaching subject. There is a shared value belief that the current professional activities are inaccessible.

Table 1 provides the mean and standard deviation resulting from descriptive statistics. In Table 1 it is clear that the data was not concentrated around the mean because the standard deviations were bigger. There was skewness in the data, and therefore a normal distribution was not possible.

***Table 1**: Descriptive Statistics: Mean & Standard Deviation*

Descriptive Statistics			
	Mean	Standard Deviation	N
Gender	1.59	.492	986
Race	1.32	.591	986
Experience	5.27	1.752	985
Locations	2.75	1.169	927
ICT Prior Knowledge	1.67	.471	942
Phases	2.18	.821	975
Computers	2.49	1.136	982
Confidence Using Technology	3.32	1.447	904
Use Learning Management Systems	3.16	1.351	882
ICT Skills Development	1.78	.909	960
Teacher Networking	1.96	1.043	603
Technological Knowledge	1.88	.936	931
Special Needs Students	1.72	.930	934
Teaching Multicultural Classroom	2.00	.943	933
Continuous Professional Development Activities	2.65	1.348	923

In Figure 2 we looked at the variability of the mean and the standard deviation to determine the distribution of the data. Standard deviation is the summary measure of the differences of each observation from the mean. Figure 2 gives us a good measure of variability to understand the distribution. In this case we can conclude that the data is very spread out and even the distance between the mean and the standard deviation is large. The use of ICT is widely spread out, which tells us that there is a lot of work needed to achieve a normal distribution in the use of ICT in the classroom. There is no option for teachers but to acquire a level of computer literacy in order to participate in the digital society. The indispensable demand for computer literacy is calling for a systematic approach to ICT teacher development so that teachers in South Africa are not isolated from the global village.

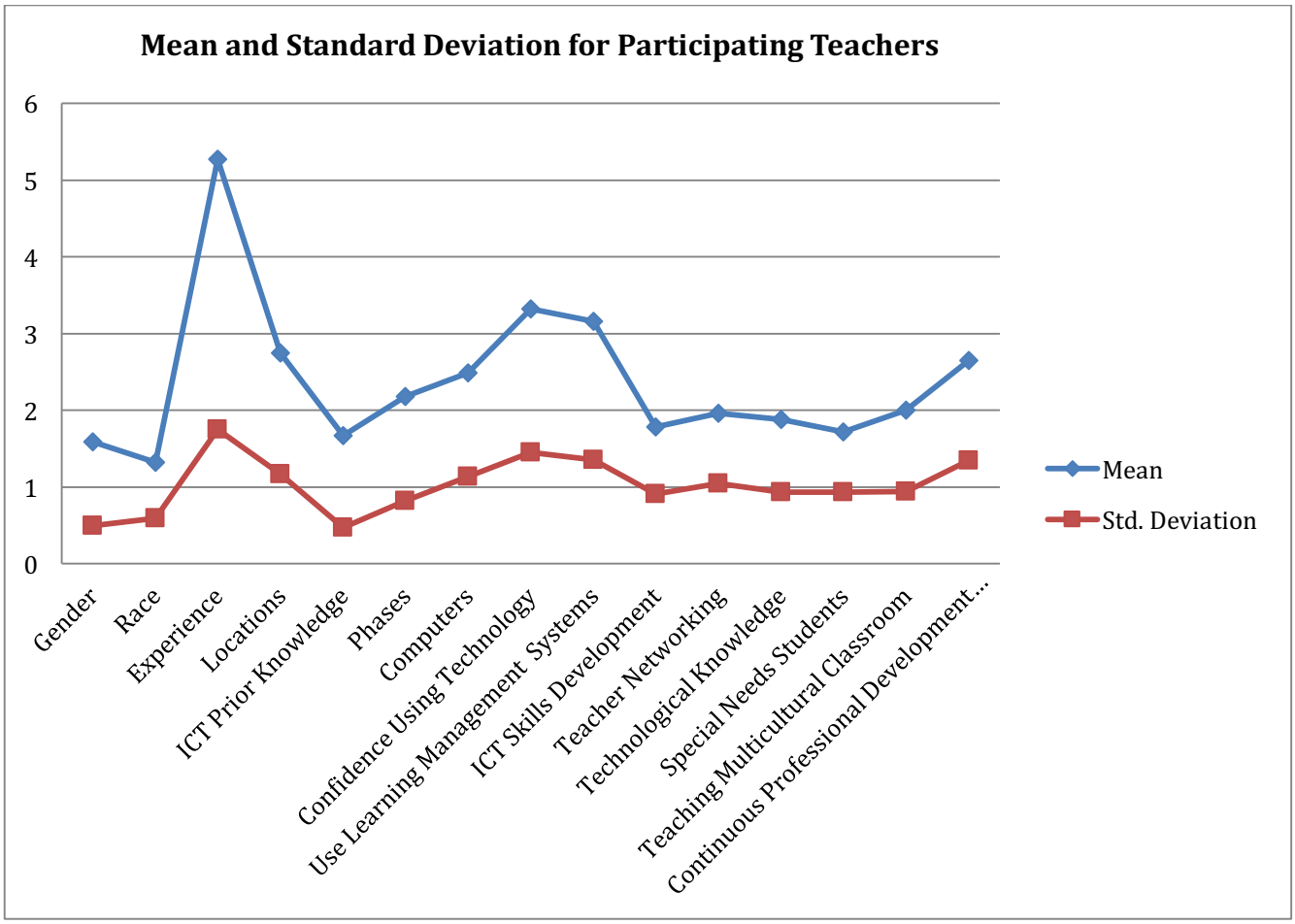

***Figure 2**: Teacher Profiles*

In Table 2 we performed the Pearson correlation analysis to understand the relationship between variables at 0.01 significance level. The significance level 0.01 was used because of the small sample to avoid misleading reach significance. The union has more than 200 000 members, yet only 986 participated in the study. The sign of the correlation coefficient determines the relationship of the correlation as it can be positive, negative, and no correlation. According to Peck, Olsen, and Devore (2015) the Pearson correlation coefficient "only measures the inherent strength of the linear relationship between two numerical values" (p. 228). In this case we use Evans' (1996) guide on strength of correlation whereby an absolute value or *r* is suggested:

- .00–.19 – very weak
- .20–.39 – weak
- .40–.59 – moderate
- .60–.79 – strong
- .80–1.0 – very strong

In the Pearson correlation in Table 2 we highlight two variables with strong to very strong correlation using red, while those with moderate correlation are identified with yellow. The rationale to identify moderate to very strong correlation is that more work needs to be done to bridge the gaps and inequalities that exist in our school system. CPD activities improve access and equity for those who need to develop their content knowledge (Robinson, 2008).

***Table 2**: Pearson Correlations*

Pearson Correlations															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Gender [1]	1	-.047	-.036	.039	-.008	.322**	.110**	-.114**	-.040	.018	-.065	-.083**	-.062*	-.058*	-.067*
Race [2]		1	.027	.261**	-.080**	.003	.198**	.062*	.112**	.181**	-.007	.156**	.059*	.154**	.073*
Teaching Experience [3]			1	.087**	.314**	.123**	.191**	-.078*	-.057*	-.167**	-.041	-.170**	-.119**	-.100**	.064*
Locations [4]				1	-.042	-.041	-.007	-.037	-.031	-.017	-.047	-.064*	-.036	-.031	-.080**
ICT Prior Knowledge [5]					1	-.029	.354**	-.098**	.122**	-.246**	.035	-.264**	-.118**	-.158**	.053
Phases [6]						1	-.060*	.065*	.032	.009	.008	.064*	.060*	.057*	.162**
Experience Computers [7]							1	-.202**	.150**	-.250**	.089*	-.282**	-.121**	-.142**	.002
Confidence Using Technology [8]								1	.703**	.146**	-.041	.169**	.073*	.089**	.014
Use Learning Management Systems [9]									1	.153**	-.025	.115**	.073*	.083**	-.002
ICT Skills Development [10]										1	-.045	.463**	.259**	.333**	.047
Teacher Networking [11]											1	-.050	.089*	-.022	.106**
Technological Knowledge [12]												1	.427**	.439**	-.061*
Special Needs Students [13]													1	.438**	-.032
Teaching Multicultural Classroom [14]														1	-.006
Continuous Professional Development Activities [15]															1

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

DISCUSSION OF RESULTS

The uneven distribution of meaningful ICT development opportunities has created fault lines in schools. These fault lines in turn created gaps in the adoption of ICT for educational purposes in South Africa. There is a great need for teachers to have access to specific programmes or intervention programmes designed and implemented based on their need to enhance their teaching and participation in professional learning communities. Therefore, to realise 'collectively-owned capital' (Bourdieu, 1986) in the pedagogical ICT integration in teaching and learning, there is a need for enabling structures for teachers, especially in the quintile 1 to 3 schools. The absence of 'collectively-owned capital' affects technological knowledge access by teachers in quintiles 1 to 3. South African schools are categorised into five groups, called quintiles, for purposes of allocating financial resources. Quintile 1 is the poorest, while quintile 5 is the least poor. Given the state of ICT in schools, the objectives of this paper were

- To investigate why ICT tools are not being integrated in teaching and learning in schools that already have access to computers.
- To understand the general views of educators about current professional development activities.
- To provide insights on how meaningful and systematic teachers' professional development programs can increase the effectiveness of innovation in education.

The broad consensus is that CPD is the most important school variable influencing student achievement (Robinson, 2008). Therefore, giving teachers' access to CPD promotes social justice, especially in areas that have been marginalised and where teachers tend to be less qualified. South Africa suffered from apartheid policies that created inequalities within areas that were less well-resourced and supported. Therefore, we have a problem of less qualified teachers and inefficient resources in some places, as well as the challenges of the 21st century classroom and learner. Our government needs to make sure that teachers have all the necessary support, especially in rural and resource-poor areas. Teachers should have access to relevant professional development opportunities and not the current methods of "workshopping" educators. It should not be an event but ongoing professional development activities whereby teachers actively engage in instructional inquiry to improve their classroom practices.

Villegas-Reimers (2003) asserted that teachers' professional development approach "requires the transformation of processes and policies that support teachers, their education, their work and their growth in the profession" (p. 141). In our view, both national and provincial governments must enhance CPD to encourage professional connectedness and develop system-wide policies to promote good quality and affordable programmes. Carnine (1992) argued that "just like that of any other professional, teachers' efficacy is dependent on the tools at their disposal" (p. 13). Moreover, "if teachers are to be held accountable, then the educational establishment must be held accountable for providing relevant knowledge and the viable professional tools derived from that knowledge" (Carnine, 1992, p. 16). It is clear that teachers must be enabled for life-long learning, instead of allowing financial resources to create a barrier to CPD access. Robinson (2008) went a step further and suggested a 4As framework for teachers' professional development. The rights-based continuing professional development consists of availability, access, acceptability, and adaptability (Robinson, 2008). This 4As framework was developed to achieve equity and social justice to the elimination of disadvantage.

In Table 2 the correlation varied immensely; however, it was clear that correlations were weak except for a strong correlation between 'Confidence Using Technology' and 'Use of Learning Management Systems.' There are four moderate correlations: 'ICT Skills Development' and 'Technological Knowledge'; 'Technological Knowledge' and 'Special Needs Students' as well as 'Teaching Multicultural Classroom'; and 'Special Needs Students' and 'Teaching Multicultural Classroom.' This is an indication that confidence plays an important role for teachers to adopt and

integrate educational technologies. We also observe the moderate correlation between 'Technological Knowledge' and 'Diversity or Inclusivity in the Classroom'. It is clear that teachers are aware of the benefits of developing their technological knowledge in order to enhance their teaching and learning in a diverse classroom.

CONCLUSION

It is evident that teachers' ICT professional development needs are inadequately addressed by the current ICT professional development activities, thus the slow adoption and ineffective ICT integration in the classroom. Teachers must receive efficient, effective, and affordable professional development programmes to enable life-long learning. These CPD activities need to be assessed continuously to document their value in teachers' knowledge and learners' attainment. Professional development activities should not be funnelled through utopian perspectives, and the context of the participants must be taken into consideration because teachers' lived experience can help in designing meaningful ICT professional developments. This can be achieved by assessing ICT professional development and teacher involvement in communities of practice. Evaluation of the influence of ICT professional development in pedagogical integration is important because it will point out the areas of need in ICT pedagogical integration.

Teachers in quintile 5 schools have access to meaningful ICT professional development activities to develop their technological pedagogical knowledge and technological content knowledge. And while teachers in lower quintile schools expressed their desire to access continuous training to help them develop technological knowledge, some of them have never used a computer before. These schools have the lowest level of ICT adoption, and issues of security are not helping the situation because equipment gets stolen, leaving teachers with no computers to develop their own ICT skills. Principals exert stringent rules to protect computers, making continuous access difficult, and this could be another contributing factor to the low adoption. Further, there are no computer periods in schools as the usage is restricted to teaching and learning, and therefore developing ICT skills is done on ad hoc basis.

Quintile 5 schools have developed strategies to make sure learners and teachers develop their ICT skills so that they become confident and see the value of the machines. The adoption of computers for teaching and learning was dependent on the confidence to adopt the tools and on the school leadership. In the quintile 5 schools the principals and deputy principals were highly involved and worked on ICT strategies for the schools. The schools that integrate ICT in the classroom have a policy in place and champion teachers on the ground, which provides support. In fact, those teachers participate in various ICT conferences and present what they do in the classroom.

According to Karagiorgi and Charalambous (2006), the ultimate intended outcome of professional development is the impact on classroom practice. Karagiorgi and Charalambous (2006) strongly argue that the primary purpose of evaluation of professional development is to ensure implementation in the classroom as well as to provide continuous guidance and support to teachers. Evaluations for professional development are designed to answer abstract questions and gauge the value (Guskey, 1999). Meaningful professional development activities to develop their technological pedagogical knowledge and technological content knowledge is of paramount importance to effect change in the classroom practice. In addition to ICT professional development activities, technological infrastructure must be in place and accessible.

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INFORMATION SHEET (INCLUDING CONSENT)

Dear Educators:

The Wits School of Education understands the importance of Information & Communication Technology (ICT) tools in the classroom. To counter the confusion caused by the public and private agencies equating the provisioning of ICT infrastructure [hardware] to pedagogical ICT integration in schools, the absence of research informing ICT integration in South Africa, and understanding the inconsistencies in the social, cultural and economic status of the communities the Wits School of Education decided to profile teachers and schools using research. The research has the following objectives:

- To build the Gauteng province picture of how technologies are used in the classrooms.
- To understand variations in practice and access in the province.
- To find case studies of how digital learning is successfully practised.
- To investigate educators' perspectives, attitudes towards ICT integration, experience of ICT usage, intentions to use ICT in teaching & learning, self-efficacy as well as their ICT competencies.
- To understand if schools and teachers are ready for eLearning.

Please note the following with regard to participating in the survey

- Participation is entirely voluntary. However, given the importance of your response, you are encouraged to participate.
- It is anticipated that the survey will take no more than 10 minutes of your time. You are therefore encouraged to complete it.
- The results of the survey will be mainly used to develop meaningful intervention programmes driven by your needs and the schooling environment contextual needs.
- A concise report will also be made available to Wits School of Education for circulation to all members.

CONSENT TO PARTICIPATE

Before commencing with the survey, it is important that you indicate your consent to participate by ticking on the appropriate response box below:

Consent to participate in this survey	√
I am interested in participating in this survey	
I have no interest in participating in this survey	

SURVEY QUESTIONNAIRE

DEMOGRAPHICS

1. Please indicate your gender
   [ ] Male [ ] Female

2. Please indicate the district you work in

EN	ES	GE	GN	GW	JC	JE	JN	JS	JW	SE
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]		[ ]	[ ]
	[ ]									

SW	TN	TS	TW
[ ]	[ ]	[ ]	[ ]

3. Please indicate your race
   [ ] African [ ] Coloured [ ] Indian [ ] White [ ] Other

4. How long have you been working as a teacher?

1st yr	1 – 2 yrs	3 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	20+ yrs
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

5. Did you have any ICT training before starting to teach?
   [ ] Yes [ ] No

6. How long has your school been using computers for teaching?
   [ ] 1 – 3 Years [ ] 3 – 5 Years [ ] 6 – 10 Years [ ] 10 Years +

7. Which of the following technological tools do you have access to, for professional use?
   Select all applicable

Access to technology	√
Laptop	
Desktop Computer	
Reliable internet connection (WiFi)	
Reliable internet connection (3G/4G+)	
Reliable internet connection (Local Area Network or Wire Connection)	
Mobile device (smartphone or cell phone) with internet access and email functionality	
Mobile device (tablet) with internet access and email functionality	
Mobile device without internet access	
Smartboards	

8. What characteristics do you think are important for educators to successfully integrate ICT in teaching? Please rank the following according to how you see them:

Characteristics for succeeding in ICT integration	**Most Important**	**Important**	**Neutral**	**Least Important**	**Not Important**
Skills					
Confidence					
Attitude					
Training					
Support					
Policy					
Curriculum					

9. Please indicate your experience with the following:

Please indicate your experience with:	**Well Experienced**	**Experienced**	**Neutral**	**Not Experienced**	**Not Well Experienced**
Computers					
Internet					
e-learning platform (e.g. Blackboard, Moodle,etc)					
Overhead Projector					
Word processor					
Spreadsheets [Excel]					
Experience using digital technologies to teach					
PowerPoint					
Data Projector					
Smartboards					

10. Think of your own professional development needs. Please indicate the extent to which you have such needs in each of the areas listed below:
[4] No need at all [3] Low level of need [2] Moderate level of need [1] High level of need

Professional Development Needs	**Ranking**
Using ICT for teaching	
Selection of ICT resources appropriate for teaching	
Use of ICT for assessment	
Knowledge and understanding of using ICT in your specific subject(s)	
Technological Pedagogical Knowledge	
Use of ICT for administrative purposes	
Use of ICT for teaching purposes	
Use of ICT as a repository tools	
ICT integration the classroom	
Development of ICT skills in a particular context	

11. What is your level of integration of ICT into your teaching?
[ ] Entry [ ] Adoption [ ] adaptation [ ] Appropriation [ ] Innovation

12. How often do you do the following in your school:
[1] Never [2] less than once/yr [3] Once/yr [4] 3-4 times/yr [5] Monthly [6] Weekly

School Activities	Assign
Attend staff meetings to discuss the vision and mission of the school	
Discuss school's ICT policy	
Discuss and decide on the selection of teaching resources	
Sharing ideas on how to use ICTs for assessment	
Take part in professional development activities	

If never please explain why?

13. Think of your own technological knowledge. Please indicate your level of confidence:

	Strong Agree	Agree	Neutral	Disagree	Strongly Disagree	No Opinion
I feel confident using e-learning systems (e.g. Blackboard, Moodle, etc)						
I feel confident operating computers						
I feel confident using online learning materials to teach						
I feel confident using ICTs as teaching tools						
I feel confident using ICT tools to enhance my teaching						
I feel confident using e-learning resources to promote learner-content interaction						
I feel confident using e-learning resources to promote learner-learner interaction						
I feel confident using e-learning resources to promote teacher-learner interaction						
I feel confident using the internet to research						
I feel confident using e-learning materials to teach						

14. Do you feel less knowledgeable using ICT than your learners?
    [ ] All the time [ ] Most of the time [ ] Sometimes [ ] Not at all

15. Give a brief summary of the status of your computing and digital infrastructure at your school school (in terms of SMART Boards, Tablets, Software, Connectivity, Computers):

Original article at: http://ijedict.dec.uwi.edu/viewarticle.php?id=2431