Teacher Professional Development and Quality of Pedagogical Practices in Public Secondary Schools in Uganda

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Abstract

This article provides an analysis of the influence of teacher professional development on the quality of pedagogical practices in public secondary schools in Uganda. The study specifically examined the extent to which induction, coaching and training workshops explain variations in the quality of pedagogical practices. The study was prompted by the persistent criticisms about the deteriorating quality of pedagogical practices in public secondary schools in the country. The study employed a descriptive cross-sectional survey design. A multi-stage sampling approach was used to select 95 public secondary schools from the four regions of Uganda. Data were collected from 76 head teachers, 934 teachers and six officials from Uganda's Ministry of Education and Sports (MoES) using survey, interview, observation and document analysis methods. Data collected from teachers was analyzed using descriptive statistical analysis and ordered logistic regression; while content analysis was used to analyze qualitative data collected from lesson observation, document analysis, head teachers and MoES officials. The findings suggest that teacher professional development positively impacts on the quality of teacher preparation, teaching methods and assessment of learners; and yet systematic induction and mentoring programmes for beginning teachers and institutionalized continuous professional development systems for serving teachers are lacking in most public secondary schools. The researcher thus concluded that teachers' pedagogical practices are dependent on the manner in which they professionally developed, other factors notwithstanding. Therefore, the study recommends that in order to enhance the quality of pedagogical practices, the Ministry of Education and Sports should expedite the implementation of the secondary teacher development management systems (STDMS) programme in order to ensure continuous professional development of teachers.

Key words: Teacher Professional Development, Quality of Pedagogical Practices, Secondary Teacher Development Systems, Uganda

Introduction

There is growing concern about teacher classroom behaviours that facilitate learning in public secondary schools in Uganda. A great variation exists between what teachers do in the classroom and what they are expected to do as stipulated by the Directorate of Education Standards (DES) and the National Curriculum Development Centre (NCDC) (Ministry of Education and Sports [MoES], 2013). According to the Curriculum Assessment and Examination (CURASSE) (2007), the teachers are neither innovative nor creative, and rarely use learner-centred instruction methods. The concepts that are taught hardly relate to everyday life, and teachers go to classes without lesson plans. Consequently, teaching focuses on cramming to pass national examinations and does not enhance the development of higher order thinking skills (Uganda National Examinations Board [UNEB], 2012). Uncovering factors that enhance

the quality of teaching and learning is critical to improve the overall quality of education of a country. Musaazi (2006) advises educational planners and administrators to emphasize teacher professional development to bring about desired classroom behaviours from teachers. Musaazi (1982) asserts that the period of pre-service training is too short to sufficiently equip teachers with knowledge and skills to address the ever-changing pedagogical demands. In congruence with Musaazi, other writers (Campbell & Thomas, 2013; Zepeda, 2010, Russell, 2012; Mulkeen, 2010) emphasize the central role professional development plays in this era of change where teachers have to continuously acquire new knowledge on new curricula, and new skills to meet the dynamic technological demands and enhance the quality of pedagogical practices. In this regard, the study sought to establish the extent to which teacher professional development explains the quality of pedagogical practices in public secondary schools in Uganda.

In the 1960s, Uganda's education system was among the best on the African continent (Government of Uganda, 1992). Teaching focused on developing learners' competences and fostered higher order thinking skills. Graduates at different levels of education were equipped with adequate skills tailored to the job market (Ssekamwa & Lugumba, 2010). The wars and civil strife during the 1970s and 1980s led to the neglect of educational institutions and decline of quality of education at all levels (Uganda Government, 1992). The quality of teaching suffered because scores of teachers fled the country, while the morale of those that remained declined. In order to re-establish the quality of education and accelerate development, government introduced major reforms in education in line with the Education White Paper (MoES, 2009). The reforms included implementation of Universal Primary and Secondary Education, among others. Universal Secondary Education (USE) has expanded access to secondary education for many Ugandans, including the poor and vulnerable who could not afford secondary school (MoES, 2015). However, many students completing secondary school under USE are not able to speak and write good English even when they are taught and assessed in English (Khisa & Lanyero, 2009), an indication of the low quality of teaching despite high enrolment numbers. Indications of low quality include: increasing examination malpractices, increased rote learning, holiday coaching, examination-oriented teaching and part-time teaching by many teachers.

This study was anchored on Taylor's scientific management theory which emphasises the need to monitor actual performance of workers and compare it with the set standards to ensure conformity and provide continuous training to improve performance (Rue & Byars, 1992). Quality teaching and learning demands teachers to align teaching to national-level standards and procedures set by NCDC and DES. Head teachers and inspectors of educational institutions should continuously supervise teaching practices to establish the level of teacher conformity to set standards and the challenges teachers encounter in the teaching and learning process (Zepeda, 2010). Inspectors should identify variations of delivery from the planned procedures and take corrective action to improve the quality of pedagogical practices (Ayeni, 2011). The action may be temporary through practical solving of the problem or permanent, with the aim of sustaining the improved process (Sokovic, Pavletic & Kern Pipan, 2010). Corrective action includes teacher professional development intended to address identified gaps in the pedagogical practices.

The study concentrated on two main concepts: teacher professional development and quality of pedagogical practices. According to Wanzare and Da Costa (2000), teacher professional development is a teacher training approach that aims at improving teachers' teaching methods, their ability to direct teaching to meet students' needs, and classroom management skills. Relatedly, Fullan (1995), cited in Ayeni (2011), defines teacher professional development as any formal or informal in-service teacher training aimed at addressing the ever changing demands of the teaching profession. Teacher professional development in this study was perceived as the in-service teacher training aimed at continual improvement of teaching skills and knowledge to match the ever-emerging issues and changes in education. Approaches to teacher professional development include, among others: induction of new teachers, coaching and training workshops (Zepeda, 2010; Musaazi, 2006).

Induction in the school setting means the process of helping new teachers meet their needs for security, belonging, status, information, and direction on the job and in the school community (Musaazi, 2006). The school administrators are expected to provide new teachers with information about the school and community in which the school is situated. Coaching, on the other hand, is a one-on-one relationship between two persons or groups which offers the less-experienced person continued guidance and feedback on handling their tasks with the view of improving individual performance (Maicibi, 2007). Coaching is intended to provide opportunities for teachers to support and learn from each other and to engage in realistic discussions about their own teaching and learning experiences (Zepeda, 2010).

Training workshops usually take three to ten days depending on the seriousness of the issue at hand. During this period, resource person(s) make presentations on a subject matter followed by group activities. The outputs of these groups are presented and discussed in plenary sessions later. Workshops help teachers to share knowledge and experiences.

Pedagogical practices in this study meant the various types of tasks, ways of working or types of activities and practices which guide effective teaching and learning (Lakkeal, 2011). Such practices include, among others: preparing schemes of work, lesson notes, and teaching aids; promptly setting an adequate amount of written and practice exercises; prompt and careful evaluation of all written and practical exercises; and undertaking remedial teaching to ensure effective teaching and learning (MoES, 2012). Therefore, 'quality of pedagogical practices' in this article refer to teaching practices that conform to the guidelines issued by DES and NCDC.

Statement of the problem

Despite the Government's initiatives to improve the quality of teaching and learning at secondary school level, quality of pedagogical practices in public secondary schools remain poor (ESAPR, 2014). The poor quality of pedagogical practices in these schools is manifested through teachers' lack of planning for lessons (DES, 2012; UNEB, 2015); using mainly teacher-centred instead of learner-centred methods of teaching (DES, 2012); and administering unplanned tests and assignments to measure learning achievements (UNEB, 2012). Furthermore, learner assessments are geared towards passing national examinations while other objectives of the curriculum such as promotion of moral values, practical skills and

participation in social and cultural activities are not catered for (UNEB, 2015). And it appears teacher professional development strategies are generally lacking in the public secondary schools (Kagolo, 2014; MoES, 2014). If the quality of pedagogical practices is not addressed, dropout and failure rates in secondary schools are likely to increase, resulting into wastage of resources dedicated to education and under-development of the country's human resources.

Study Objectives

The purpose of the study was to establish the extent to which teacher professional development explain quality of pedagogical practices. Specifically, the study focused on investigating the extent to which induction of new teachers, coaching and training workshops explain the quality of pedagogical practices in public secondary schools in Uganda.

Literature review

Review of literature reveals a growing number of studies on teacher professional development (Campbell & Malkus, 2011; Carpenter, Fennema, Peterson, Chiang & Loef, 1989; Connor, Morriso, Schatschneider, Toste, Londblom, Crowe & Fishman, 2011, Garet, Cronen, Eaton, Jacob & Lefgren, 2004; Joyce & Showers, 1981; Kurki, Ledwig, & Jones, 2008; Zhang, 2012). Although these studies have not specifically addressed the situation in Uganda, they have added to the body of knowledge demonstrating the critical role of teacher professional development in enhancing teacher classroom practices (Campbell & Malkus, 2011; Connor, Morriso, Schatschneider, Toste, Londblom, Crowe & Fishman, 2011, Garet, Cronen, Eaton, Kurki, Ledwig, & Jones, 2008; Joyce & Showers, 1981).

Findings of several of these studies (Campbell & Malkus, 2011; Darling-Hammond, Wei, Adree, Richardson & Orphanos, 2009; Carpenter, Fennema, Peterson, Chiang & Loef, 1989) indicate a significant relationship between professional development and performance of teachers in the classroom. Campbell and Malkus (2011), however, assert that teacher professional development will only impact positively on teacher practices in the classroom when conducted by experienced teachers with an in-depth understanding of the subject area. Other studies such as the experimental study on the impact of teacher training on the teacher and student outcomes in Beijing Migrant Schools (Zhang, 2012) and the impact of teacher training on student achievement in Chicago schools (Jacob & Lefgren, 2004) demonstrated that teacher professional development was ineffective with regard to teacher and students' performance. However, these findings are silent on the impact of teacher training on quality of pedagogical practices.

A debate on the more effective professional programmes is distinct in the literature. Findings of several experimental research studies indicate that teacher professional development programmes of longer duration, such as workshops, have a more significant contribution to the quality of teaching and learning (Darling-Hammond, Wei, Adree, Richardson & Orphanos, 2009). According to Truesdale (2003), studies on transferability of peer coaching to classroom practices established that coaching was more effective than training workshops because coached teachers tend to apply classroom practices that they learn from their senior colleagues. Zepeda (2010), however, advises that for coaching to be effective, communication between the teachers involved should be honest, open, and teachers involved should be willing to help

each other to improve on the quality of teaching and learning. Knight and Cornett (2009) take a middle position; they advise that teachers should be coached before implementing practices learned during the training workshops to improve the quality of pedagogical practices.

Institutionalized teacher professional development programmes are lacking in Uganda's public secondary schools (MoES, 2014a). The existing programmes, according to the Teachers' Initiative in Sub-Saharan Africa (TISSA) report of 2013 (MoES, 2013), are uncoordinated and lack a systematic approach for professional growth. The need for a well-coordinated continuous teacher professional development for secondary school teachers in Uganda is emphasised by the National Assessment of Progress in Education (NAPE) report of 2014 (UNEB, 2014) which points out issues of teacher competence at lower secondary school level. According to the report, teachers in lower secondary schools lack the competences in the subjects they teach. An attempt by the Ministry of Education Sports to enhance effective teaching and learning through continuous in-service training of secondary school teachers under the STDMS programme has failed to take off as a result of lack of funds (MoES, 2015).

Methodology

A descriptive cross-sectional survey design was adopted for this study. The study population comprised head teachers and teachers in public secondary schools and officials of the Ministry of Education and Sports (MoES). A multi-stage sampling technique was used to select 95 schools from four sub-regions that included Buganda, Ankole, Elgon and West Nile. Using stratified random sampling, teachers were selected from each stratum based on lists provided by the Ministry of Education. Stratification was based on the school status (Universal Secondary Education [USE] and non-USE). A sample of 934 teachers, 76 head teachers and two officials from the DES participated in the study. Questionnaire, interview and observation methods were used to collect data. The instruments were pre-tested before they were administered. The results of the descriptive analysis were presented in tables indicating frequencies and percentages. A logistic regression model was used to establish the extent to which explanatory factors contributed to the variability of dependent variables. The tests of significance were performed at the probability level of $p< 0.05$. Data collected using a structured interview guide, an observation checklist and document review guide was deductively analysed basing on pre-determined variables from the conceptual framework of the study.

Results

Profile of Respondents

An overview of the demographic characteristics of the study respondents is presented in Table 1 below.

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage
Q1. Gender	Male	644	69.0
	Female	290	31.0
Q2. Qualification	Diploma	208	22.3
	Bachelors	577	61.8
	Post-graduate	149	15.9
Q3. Length of years in the school	Less than 3 years	175	18.7
	3 to 10 years	554	59.4
	10 years above	205	21.9
Q4. School type	USE	628	67.2
	Non- USE	306	32.8
Q5. Subject type	Arts	598	64.0
	Sciences	336	36.0

Source: Primary Data

Results in Table 1 show that more male teachers (69.0%) participated in the study as compared to their female counterparts (31.0%), indicating a gender disparity in employment. The results also show that the majority of the teachers in the sample (77.7%) had a Bachelor's degree, the requisite qualification to teach at secondary school level. In relation to number of years spent in the schools, findings in Table 1 show that the majority of the sampled teachers (81.3 %) had taught for more than three years in their respective schools. This indicated that the respondents had long-standing cognate experience in serving as teachers. Thirty-six per cent (36%) of the teachers who participated in the study were Science teachers while 64% were Arts teachers, indicating that there are fewer Science teachers than Arts teachers working in the public secondary schools.

Teacher Professional Development

Information was sought from teachers on teacher professional development practices in public secondary schools. Table 2 presents the frequencies and percentages of the responses.

Table 2: Distribution of Teachers' responses on Teacher Professional Development in Public Secondary Schools

Teacher professional development	Disagree	Non-committal	Agree
Q6. My school usually organizes induction workshops for new teachers	490(52.4%)	83 (8.9%)	361(38.7%)
Q7. My school usually assigns mentors to new teachers	688(73.7%)	99(10.6%)	147(15.7%)
Q8. Mentoring of teachers is a formal arrangement in my school	560 (60%)	98 (10.5%)	276(29.5%)
Q9. Coaching of teachers by senior colleagues is institutionalized in this school	484(51.8%)	61 (6.5%)	389 (41.7%
Q10. I usually make lesson plans with fellow teachers	447(47.9%)	51 (5.5%)	435(46.6%)
Q11. I share classroom experiences with my colleagues	275(29.4%)	95 (10.2%)	564(60.4%)
Q12. The school administration encourages team teaching	594(63.6%)	108(11.6%)	232(24.8%)
Q13. Schools regularly organize training workshops on teaching practices	538(57.6%)	43 (4.6%)	353(37.8%)
Q14. Ministry of education regularly organizes teacher training workshops	626 (67%)	92 (9.9%)	216(23.1%)
Q.15. My school sponsors teachers for further education	785(84.1%)	62 (6.6%)	87(9.3%)

Source: Primary Data

Results in Table 2 suggest that most public secondary schools hardly induct or mentor new teachers. However, the findings propose that, to a fair extent (above 40%), there is coaching of teachers taking place in public secondary schools. The majority of teachers (60.4%) indicated that they share classroom experiences, suggesting that peer coaching exists in these schools. Results in the table indicate that training workshops are rarely organized by either the schools or the Ministry of Education. With regard to sponsoring teachers for further education, the finding suggests that public secondary schools hardly sponsor their teachers.

Interviews with the head teachers revealed the absence of regular programmes to induct new teachers in public secondary schools. All the interviewed head teachers said teachers are introduced to the heads of department, the rest of the teaching staff and then to the students' general assembly. One head teacher explained that "beginning teachers eventually learn from colleagues already established in the school after they have been formally introduced to their respective subject heads, staff, and students' community".

Interviews with the head teachers of both USE and non-USE schools across the sub-regions indicated that in most of the schools coaching was not a formal arrangement. Teachers were encouraged to work as teams, in the preparation of lessons, teaching and assessment of students. One head teacher described the situation thus: "junior teachers with teaching difficulties are encouraged to be honest so that senior teachers or teachers good at a given

area may help them through sharing knowledge, teaching notes and experiences". The head teachers explained that senior and experienced teachers usually helped their colleagues to improve on their teaching skills by sharing with them classroom experiences, helping them prepare for lessons, set and mark examinations and use a variety of teaching methods. .

Interviews with the official from Teacher and Instructor Education and Training (TIET), the department responsible for training secondary school teachers revealed that there were no institutionalized systems for Continuous Professional Development of teachers in secondary schools to enable them improve their professional competences. The official described the situation as follows:

> *Secondary Teacher Development Management Systems (STDMS) initiative that was intended to institutionalise in-service training of serving secondary school teachers and head teachers through support supervision, mentoring and coaching is yet to commence since the road map had been approved. STDMS is intended to improve teacher quality and development for overall improvement in secondary school students' learning and competence levels.*

In relation to training workshops, information from the head teachers revealed that organizing of the workshops depended on the financial ability of schools. One head teacher described the situation thus: "If we are to organize other training workshops, we hire resource persons or organizations to conduct these trainings and this requires money." This implied that USE schools had a challenge of organizing in-service training workshops since they did not charge Parents Teachers Association (PTA) fees. On the other hand, non-USE schools that charge PTA fees enhance their financial capacity to invite resource persons to talk to the teachers when internally training workshops are organized. The head teachers, however, appreciated the significant contribution of Secondary Science and Mathematics Teachers (SESEMAT) workshops to improving teacher preparation, teaching and assessment of learners. In this regard, one head teacher had this to say:

> *We are so grateful for the contribution SESEMAT has made towards enhancement of teacher professional development through in-service training workshops. These workshops have focused on teachers' use of learner methods of teaching, use of locally available resources and teacher preparation. There is a great change in the quality of teaching of these teachers. Unfortunately, these workshops benefit only teachers of Physics, Chemistry, Biology and Mathematics.*

However, the officials disclosed that SESEMAT was facing a challenge; schools were not embracing approaches of teaching it was advocating. According to the officials, the head teachers claimed that the learner-based methods of teaching advocated by SESEMAT were time-wasting; if they were embraced, the syllabi would not be completed in time for the National Examinations. For example, one head teacher from Mukono District in Buganda sub-region had this to say with regard to adopting the learner-based methods of teaching:

> *The learner-based methods of teaching would be the best to use, but given the competition of our schools in the National Examinations, these methods may not apply. The teachers must complete the syllabi in time for rigorous revision with the students in preparation for the national examinations. However, we encourage our teachers to use SESEMAT's approaches in the lower sections (Senior One and Senior Two).*

During interviews with the head teachers in the rural hard-to-reach areas of Elgon sub-region, the role of SESEMAT in providing in-service training to science and mathematics teachers was highly appreciated. However, these head teachers were concerned about the non-attendance of their teachers. They lamented that some teachers did not attend the training workshops since they were engaged in other money-generating activities. One head teacher of a USE school in Bulambuli District explained:

> *As a head teacher, I would have wished to have all teachers of Sciences and Mathematics to attend SESEMAT workshops but some of them don't attend these workshops because they engage themselves in other money generating activities at the time of the workshops.*

All head teachers interviewed said that schools did not financially support teachers who pursued further studies though they encouraged them morally. According to the head teachers, schools helped Grade V teachers secure study leave with pay whenever they went for further studies.

Table 3: Distribution of Teachers' Responses on Quality of Pedagogical Practices in Public Secondary Schools

Item	Disagree	Non-Commital	Agree
Q16. I regularly make schemes of work	154(16.5%)	2 (0.2%)	778(83.3%)
Q17. Using a lesson plan during teaching is a waste of time.	367(39.3%)	40 (4.3%)	527(56.4%)
Q18. I always prepare lesson notes	257 (27.5%)	17 (1.8%)	660(70.7%)
Q19. I usually assess the student's prior knowledge and skills at the start of a lesson.	82 (8.8%)	16 (1.7%)	836(89.5%)
Q20. I regularly vary teaching methods	325(34.8%)	5 (5%)	604(64.7%)
Q21. I give class exercises while teaching makes to make my teaching easy.	401(42.9%)	21 (2.2%)	512 (54.8%
Q22. My students learn best by finding solutions to problems on their own.	281(30.1%)	35 (3.7%)	618(66.2%)
Q23. I always mark the class exercises while in class.	388(41.5%)	32 (3.4%)	514(55.0%)
Q24. I usually give home work at the end of each lesson.	89 (9.5%)	27 (2.9%)	818 (87.6%
Q25. I always go through marked homework exercises with the students at the start of the lesson.	353(37.8%)	53 (5.7%)	528(56.5%)
Q26. I return marked scripts in time before the next test.	134(14.3%)	22 (2.4%)	778(83.3%)
Q27. I make corrections when I return marked scripts to students.	111(11.9%)	19 (2.0%)	804(86.1%)

Source: Primary Data

Results in Table 3 suggest that teachers in public secondary schools regularly make schemes of work, assess students' prior knowledge and skills at the beginning of lessons, give and mark homework, return and revise marked scripts with students before the next test is given. However, the findings show that a considerable portion of teachers (56.4%) perceive making lesson plans a waste of time. These results suggest that a large proportion of teachers in public secondary schools do not prepare for lessons as required by DES. Despite the unfortunate teachers' perception about making lesson plans, results suggest that the majority of the teachers (70.7%) prepare lesson notes. Findings in Table 3 demonstrate that, whereas 87.6 per cent of the teachers gave homework, only 56.5 per cent revised marked homework with the students. Furthermore, while 68.8 per cent of the teachers gave at least two tests in the subjects they taught per academic term, 83.3 per cent returned marked scripts before giving the next test. The majority (86.1%) of the teachers indicated that they made corrections whenever they returned marked scripts. These results show that teachers put more emphasis on marking tests other than the class exercises and homework.

Although the majority of the teachers (83.3%) agreed that they made schemes of work at every beginning of the term, document review revealed that most schemes of work lacked evidence of planning for teaching or learning aids and use of learner-based methods of teaching. Scrutiny of the schemes of work revealed that most teachers did not refer to NCDC guidelines that emphasized learner-based approaches and practical teaching of science subjects. The head teachers explained that teachers found it difficult to go by the guidelines because they would not be able to complete the syllabi in time for the national examinations. Results of lesson observation showed that only 33.9% used learner-based methods. Of the 33.9% of teachers who used a variety of teaching methods, 86% were science or mathematics teachers. A review of the students' exercise books revealed that only 53.5% of teachers gave and marked class exercises. These findings were in agreement with descriptive results of the teachers' responses in Table 3 where 55% of the teachers indicated that they gave and marked class exercises. Where class exercises or homework were marked, only 37% of the teachers made constructive comments after marking the students' work.

Factor analysis

Principal component factor analysis was conducted on the nine variables related to teacher professional development to extract factors for regression analysis. The Rotated Component Matrix showing factor loadings for each variable helped to identify factors that each variable loaded most strongly on. The factor loading matrix is presented in Table 4 below.

Table 4: Factor loadings with communalities based on a principal component analysis with rotated factor loadings

Variable	Factor		
	Induction	Coaching	Training Workshops
Q6. My school usually organizes induction workshops for new teachers	0.643	0.341	0.311
Q7. My school usually assigns mentors to new teachers	0.756	0.554	0.432
Q8. Mentoring of teachers is a formal arrangement in my school	0.587	0.482	
Q9. Coaching of teachers by senior colleagues is institutionalized in this school	0.457	0.832	0.419
Q10. I usually make lesson plans with fellow teachers		0.678	0.404
Q11. I share classroom experiences with my colleagues	0.324	0.781	
Q12. The school administration encourages team teaching		0.567	0.456
Q13. Schools regularly organize training workshops on teaching practices	0.341		0.848
Q14. Ministry of Education regularly organizes teacher training workshops		0.321	0.636
Q15. My school sponsors teachers for further education			

Source: Primary data

Note: Factor loadings < 0.3 were suppressed

Results in Table 4 indicate that three factors were extracted that were renamed formative evaluation and summative evaluation. Items Q6, Q7 and Q8 loaded heavily on factor 1 that was renamed Induction. Items Q9, Q10, Q11 and Q12 loaded more on factor 2 that was renamed Coaching. And items Q13 and Q14 loaded more on factor 3 that was renamed Training Workshops

Verification of the hypotheses

Ordered logistic regression was used to test the following null hypotheses:

i. Teacher induction does not significantly influence quality of pedagogical practices.
ii. Peer coaching does not significantly influence quality of pedagogical practices.
iii. Teacher training workshops do not significantly influence quality of pedagogical practices.

Results of the test are presented in Table 5 below.

Table 5: Ordered Logistic Regression Results in Teacher Professional Development

Quality of Pedagogical Practices	Coefficient	P>|Z|
Induction	4.32	0.000
Coaching	6.72	0.000
Training workshops	3.53	0.000

Pseudo R^2 =0.7405, Number of obs = 934, LR χ^2 (10) = 984.84, Prob.> χ^2 = 0.0000

Results show that all the 934 observations were used in the analysis. The likelihood ratio Chi-square of 984.84 with a p-value of 0.000($\rho < 0.05$) indicated that the model as a whole was statistically significant compared to the null model with no predictors. Pseudo $R^2 = 0.7405$ means that the explanatory variables in the model explained 74.1 % variability in the overall quality of pedagogical practices. Results show that the factors of teacher professional development that included induction, coaching and training workshops significantly ($p<0.05$) explained variability of quality of pedagogical practices. The results imply that increased induction of new teachers contributed significantly to the improved quality of pedagogical practices and the same applied to increase in coaching, and increase in the number of training workshops. The three null hypotheses were therefore rejected and the research hypotheses that induction, coaching and teacher training workshops have a significant positive impact on the quality of pedagogical practices were upheld.

Discussion of Findings

The purpose of this study was to establish the influence of teacher professional development on the quality of pedagogical practices in public secondary schools in Uganda. The results suggest that improving teacher professional development significantly contributes to improved quality of pedagogical practices. The findings are consistent with earlier studies (Kazmi, Pervez & Mumtaz, 2011; McDiarmida & Bright, 2008). However, the results are contrary to findings of Jacob and Lefgren (2004) who in their study on the impact of teacher training on student achievement in Chicago schools established no significant relationship between teacher in-service training and student achievement, and to the findings of Zhang (2012) which revealed that in-service teachers' training was ineffective on teacher and students' performance.

Despite the significant contribution of teacher professional development to the quality of pedagogical practices, institutionalized Continuous Professional Development systems in schools are generally lacking. The teacher professional programmes, as observed in the TISSA report (MoES, 2013), are uncoordinated and lack a systematic approach. Failure by the Ministry of Education and Sports to implement the STDMS programme that would have institutionalized the induction of new teachers, coaching, and training workshops for teachers and school administrators has hindered the refreshment of knowledge and reflection on professional experience (Orenaiya, 2014). An institutionalized national system would not only improve teacher performance in the classroom and cover the actual educational needs, but would as well provide a harmonized continuous teacher education needed to address the changing demands of the teaching profession, such as change in curriculum and use of ICT to teach in the modern times (Ayeni, 2011; Mulkeen, 2010).

The existing teacher professional development mechanisms in the public secondary schools that are majorly informal are not adequate to address the contemporary needs of teachers associated with the curriculum and technological change. The study established that new teachers are not formally inducted in public secondary schools to meet their needs for security, belonging, status, and direction in both job and school community. Yet formalized induction programmes provide logistical, emotional, and teaching support to ease a new teacher's transition from a student to a professional, which leads to the strengthening of the teaching practice (Zepeda, 2010; Musaazi, 2006; Darling-Hammond, 1997). The study further

established that there is an attempt by experienced teachers with an in-depth understanding of the subject to assist their junior colleagues to: prepare for lessons, use appropriate teaching methods and set and mark examinations, with the aim of enhancing the quality of teaching and learning. The one-on-one relationship, in which experienced teachers offer continued guidance to junior or other teachers with challenges in teaching, provided an opportunity for teachers to learn from each other and also enhanced the quality of teaching and learning in public secondary schools (Zepeda, 2012; Campbell & Maikus, 2011; Maicibi, 2007). If the peer coaching was institutionalized in schools, it would significantly boost the quality of pedagogical practices harmoniously in the public secondary schools since teachers tend to apply classroom practices learnt from colleagues (Zepeda, 2010; Knight & Cornett, 2009; Truesdale, 2003).

The study established that the schools' ability to organize training workshops depended on their financial capacity. These findings were in congruence with the findings in the TISSA report (MoES, 2013) on teacher issues in Uganda. As a result, USE schools hardly organize training workshops because they do not charge Parent Teachers' Association (PTA) fees. The study, however, established that the Ministry of Education and Sports through SESEMAT was conducting teacher-training workshops that focused on the improvement of the quality of pedagogical practices of the science and mathematics teachers in secondary schools with the intention of promoting learners' understanding of scientific, mathematical and technological concepts and skills. The training workshops concentrated on teacher preparation, use of learner-based methods (activity-based teaching), and utilization of locally available resources in the teaching and learning process. These workshops targeted only Chemistry, Physics, Biology and Mathematics teachers (MoES, 2014). However, SESEMAT trainings had a number of challenges. Firstly, several teachers had a poor attitude towards the SESEMAT approach of delivering content. The teachers were hesitant to apply SESEMAT's learner-based approaches, fearing that these would hinder early syllabus coverage. Secondly, SESEMAT was constrained by the number of staff to conduct proper lesson observations as a follow-up mechanism. The available regional trainers conducted lesson observations hurriedly and haphazardly as they struggled to cover several schools under their jurisdiction. Thirdly, SESEMAT's training was based on a cascade model which did not take into consideration the individual training needs of teachers (MoES, 2013). If SESEMAT workshops were to have a positive impact on the quality of pedagogical practices, these challenges had to be addressed.

Conclusion

The review of literature on the influence of teacher professional development on the quality of teacher practices in the classroom demonstrates that teacher professional development is a critical strategy for improving classroom instruction and learner achievement (Russell, 2012, Campbell & Malkus, 2011; Zepeda, 2010; Mpokosa & Ndaruhutse, 2008; Musaazi, 2006). Teacher professional development through continuous development programmes, such as induction, coaching and training workshops, is a critical pre-requisite for quality pedagogical practices and students learning outcomes in public secondary schools because it eventually leads to improved quality education in Uganda. However, the mechanisms available for teacher professional development are not adequate to address the contemporary needs of the teachers.

Recommendations

The Ministry of Education, Science, Technology and Sports should strengthen the teacher professional development system to offer teachers opportunities for continuous professional growth throughout their careers. Implementation of the STDMS programme should be expedited to ensure continuous teacher professional development and professional support for teachers and head teachers. Schools should plan for teacher training programmes such as induction of new staff, peer coaching and internal workshops or seminars.

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