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School-Based Continuing Professional Development in Selected Secondary Schools: Practices and Access

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Abstract: The researchers sought to explore the continuing professional development practices and access in selected secondary schools. The study employed mixed methods approach with concurrent triangulation design. The study used interview, documentary review and questionnaire data collection methods. The sample size of 54 respondents was conveniently and purposively involved in data collection. Data collected from qualitative were analysed by content analysis and SPSS was used to analyse data collected from quantitative approach. The study revealed that most of science teachers rarely engaged in school-based professional development practices. Most of teachers depended mostly in rarely conducted seminars or workshops, lesson study, peer coaching and mentoring that were organized in subject specific centres for their continuing professional development. School-based peer coaching, mentoring, feedback sessions, reflection and problem solving received minimal support from the school management. However, teachers highly acknowledged the significances of school-based CPD practices as they provided collaborative way of solving problems related to teaching as they emerge. This study recommends that, it is crucial; to develop and support regular continuing professional development activities, provide equal access to continuing learning and CPD practitioners to be well informed by policies and guidelines to effectively organize and implement CPD that improve teaching and learning.

Keywords: Continuing Professional Development, School-Based Professional Development, Practices, Access, Science Teachers.

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INTRODUCTION

Effective teaching of science is understood to be a basic foundation for achieving quality science education which is the ambition of all education systems. However, one of the most critical reform challenges facing schools today all over the world in achieving quality education is how teachers can successfully teach all students to high quality (Guskey, 2000). Quality education is a key towards preparing young generation to face challenges of contemporary society and globalization (Chediell, 2013). This is why quality education is implicit to be important for enabling acquisition of knowledge, values, attitudes and skills necessary for personal development process. Teachers' role in the provision of quality education is remarkable. Teachers to have impact on the provision of quality of education, they require important attributes such as pedagogical, content knowledge, knowledge of learners and understanding of the curriculum (Darling-Hammond, 2000).

Like in other developing countries, the quality of teacher training programmes in Tanzania that could enable teachers to acquire these attributes is still a major concern. The weakness of pre-service teacher education is acknowledged by various scholars. One of the major reasons is unbalanced teacher preparation due to that,

knowledge is broad and has been changing over time (Mkonongwa, 2012; & Anney, 2013). In addition to that mode of delivery in teachers colleges is primarily theoretical and does not provide practical experience to prospective teachers (Maro, 2004). Moreover, the great demands of science teachers as a result of students enrollment due various initiatives such as Secondary Education Development Programme (SEDP) has brought into restricting of initial training of prospective teachers at the universities and teachers colleges. Responding to the increased demand of teachers, universities reduced the training period from four years to three and Teachers Colleges (TCs) used "two-tier system" where prospective science teachers were trained for one year in teacher colleges and one year for field practice (Osaki, 2007). This had implication in the quality of teachers produced. This suggests that initial teacher education alone cannot suffice the development of afore mentioned teachers' attributes

As in other developed and developing countries, following the weaknesses of initial teacher training of science teachers, Tanzania through the Ministry of Education in collaboration with donors and universities has been funding various professional development projects for science teachers. Osaki (2007) cites most remarkable programmes include Science Education in Secondary Schools (SESS), Teacher Education

Assistance in Mathematics and Science (TEAMS) and Science Teacher Improvement project (STIP). The projects helped science teachers to sharpen their knowledge and skills on teaching through seminars and workshops in various centres. However, these projects had several weaknesses; first only few teachers were included (Kabuje, 2009; & Osaki, 2007), and second, they lacked follow up strategies such as peer coaching, mentoring, study groups, peer visit and collaboration with experts when teacher were implementing what they learned from seminars and workshops (Osaki, 2007). The mentioned programs used seminars and workshops which are just regarded as one-short programmes in which teachers passively listened to experts (Bubb & Early, 2007). Scholars regard professional development of this kind to be less effective in causing about change in the teaching practices.

That's why in-service training researcher view teachers continuing professional development as situated in physical and social context, social in nature, and distributed across individuals (Borko & Putman, 2000; & Owen, 2004). Similarly, they view construction of knowledge as situational and influenced by social context that involves the individual teacher sharing knowledge and skills with peers as a community of practice (Anney 2013). In this context, teachers' professional development has to be practiced at schools with the trust that teachers will embrace the concept of on-going professional learning for their own benefits and for the benefits of the students they teach and the community they live at large (Hailu & Jabessa, 2010). Teachers engaging in School-Based Continuing Professional Development (S-BCPD) support one another and are provided with an avenue for on-sport support from each other and the school management. Also, teachers collaboratively share ideas in study groups, co-plan lesson and lesson team teaching (Kitta, 2004).

Various scholars who have conducted researches on the use of school-based professional development programmes for teachers continuing learning revealed to be effective in improving teachers' classroom practices (Komba & Nkumbi, 2008; Kitta, 2004; Anney, 2013; & Maro, 2013). There is no specific study conducted to document the professional development practices and access of science teachers in secondary for the sake of informing decision and policy makers on how CPD can be triggered for the benefits of teachers and students. Therefore, this study investigates the current status of science teachers on practices and access of continuing professional development in selected secondary schools.

The Objective of this Study

To investigate the science teachers' professional development practices and access in selected secondary school.

MATERIALS AND METHODS

This study employed a mixed methods research approach which incorporates both qualitative and quantitative approaches. Creswell & Clark (2017) argue that mixed methods allow the researcher to use triangulation through various ways of collecting data as well as strategies for data analysis. This approach allowed the researchers to use interview guide, documentary review as well as questionnaire with the intent of supplementing the weakness that might arise from any of the methods of data collection.

Research Design

This study used concurrent triangulation design in the process of collecting and analyzing data from both qualitative and quantitative approaches. This enabled the researcher to collect, analyse, interpret and report concurrently (Creswell & Clark, 2011). The essence of using this design was to acquire better understanding of the current status of continuing professional development of science teachers in selected secondary schools in terms of on practices and access which would not been achieved through other research design.

Data Collection Methods

Data in this study were collected through interview, documentary review and questionnaire in investigating school-based professional development practices and access of science teachers in selected sample of secondary schools. Interviews were conducted to heads of school, science teachers, District Secondary Educational Officers (DSEOs), as well as District Education Quality Assurers. The reviewed documents were school time table, minutes of staff or departmental meetings, school development plan and teacher professional development records. Also, questionnaire was administered to teachers.

Data Analysis Techniques

Qualitative data from semi-structured interview, documentary review and open-ended questions in questionnaires were analysed using content analysis. The process involved organizing, categorizing and presenting meaning of data. Quantitative data from questionnaire were analysed using Statistical Package for Social Science (SPSS), version 25. The descriptive data including frequencies and percentages were then presented in tables and figures.

RESULTS AND DISCUSSION

Teachers to have good teaching practice among other factors should be provided with regular continuing professional development and should be accessible to all. The researchers wanted to ascertain the extent to which science teachers' access professional development practices and the kind of professional development practices which they get involved.

Professional Development Practices Experienced by Science Teachers

This part, researchers examined the forms of professional development practices experienced by teachers in selected secondary schools, how frequently were organized, who organized them and where they were organized. This sought to have a broader understanding of continuing professional development activities accessed by teachers.

Regarding the professional development practices accessed by science, findings from

questionnaire show that science teachers engaged in various forms of continuing professional development. Seminars and workshops accounted for 50% of all professional development activities. Other forms of professional development activities accessed by science teachers were peer coaching and mentoring, reflection and problem solving, lesson study and peer observation accounted for only 40% of all CPD (see Table 1). Some of the identified forms of professional development activities accessed by teachers were conducted at schools while others were organized in other places.

Table 1. Location and Organization of Teachers’ Professional Development Practices (N = 25)

Where was organized	Type of PD Practices	Who organized					Department s	Σf (%)
		MoEST	TIE	DSEO	TAHOSS A			
At school	-Peer coaching and mentoring	X	X	X	X	√(1)	1 (4)	
	-Workshops and seminars	X	X	√(1)	X	X	1 (4)	
	-Reflection and problem solving	X	X	X	X	√(4)	4 (16)	
Other places	-Peer coaching and mentoring	X	X	√(3)	X	X	3 (12)	
	-Lesson study	√(1)	X	X	X	X	1 (4)	
	-Workshops and seminars	√(4)	√(1)	√(1)	√(9)	X	15 (60)	
	Σf (%)	5 (20)	1 (4)	5 (20)	9 (36)	5 (20)	25 (100)	

The findings in the Table 2 show that 76% of professional development activities accessed by science teachers were organized in other places usually in selected subject specific centres. Most of these CPD activities were organized by TAHOSSA (n=9; 36%), MoEST (n=5; 20%), DSEO (n=4; 16%) and TIE (n=1; 4%). The Table 1.4 further indicates that workshops and seminars contributed for 60% of teacher in-service training while lesson plan, peer coaching and mentoring contributed for only 40% of the training. During interview, districts secondary educational officers supposed that teachers mostly attend to seminars and workshops we invite them. The DSEO₁ had this to add:

We have centres to run in-service training to science teachers mainly workshops and seminars, for example we have centre for mathematics, biology, chemistry and physics. These centers are set subject wise just for the sake of assisting teachers to acquire what they are supposed to get. Source: (Field data)

This implies that, the appointed science teachers were supposed to travel to their subject specific centres for the training. In their respective subjects centre, science teachers reported to engage in activities as per training manual hopping to improve their teaching. After training teachers departed to their respective working station ready to put what they have learned into practice. However, during interview with science teachers contended that, after training were not given on-spot support from facilitators in case they face challenges in implementing what they learned from workshops and

seminars. As a result some of them they reported failure to put into practice what was facilitated. For example during interview with teachers in school D and school E they said that in the training they attended they learned how to teach science subjects using learner centered approach. But after returning to their working stations they found unable to apply the knowledge they had learned since the classroom were overcrowded by students. The findings were in line with that of Guskey (2000) who argues that if teachers are left alone to implement what they acquired from the seminars and workshops that displace teachers from their working stations they usually feel unable to retain what was learned. Also, Sanga (2011) found that teachers went on to teach using teacher centered approach despite being trained on how to teach using learner centered approach. It can be therefore urged that teachers engaging in classroom coaching, problem solving, peer collaboration and other forms of follow-up practices are necessary backup mechanisms to change instruction and improve students’ learning.

Findings in Table 2 revealed that 56% of the identified forms of professional development practices organized in other places including subjects’ specific centres were rarely conducted. The finding suggests that science teachers in secondary schools rarely had opportunity to continue learning and testing new methodologies, how to teach challenging topics, issues of classroom management and copying with various educational reforms. Similarly, one of the DSEO in the interview pointed out that seminars and workshops were

only organized twice per year especially during vacation to avoid interruption with the schooling time table. Correspondingly, head of schools and teachers revealed that usually seminars and workshops were conducted in June and December. Thus show that in between teachers did not have chance to collaboratively learn and improve

their teaching. These findings are in contrast with Guskey (2000) who suggests that for teachers to affect student learning, they need to be provided with regular opportunities to update their knowledge through continuous professional development practices in schools.

Table 2. Types and Frequencies of Teachers Professional Development Practices Attended by Teachers (n = 25)

Frequency of conducting PD practices	Types of professional development						Σf (%)
	Peer coaching and mentoring	Peer observation	Lesson study	Workshops and seminars	Reflection and problem solving	Peer collaboration	
Rarely	3	1	2	9	4	-	19 (76.0)
Regularly	-	-	-	5	-	-	5 (20.0)
Frequently	-	-	-	1	-	-	1 (4.0)
Not at all	-	-	-	-	-	-	-
Σf (%)	3 (12.0)	1 (4.0)	2 (8.0)	15 (60.0)	4 (16.0)	-	25 (100.0)

On the other hand, only 24% (n=6) of professional development practices including peer coaching, seminars and workshops and reflection and problem solving were conducted in schools at varying degrees (see Table 1.4). Most of these professional development practices were reported to be organized by their respective subject departments (n=5; 20%) in the school and partly by the DSEO office (n=1; 4%). On top of that, the practices were reported to be conducted rarely due to various reasons including financial constraints, lack of school support and tight school schedule. In addition to that, head of some schools disclosed that they rarely organized feedback session whereby teachers who did not attend a given seminars or workshops are passed on to what was covered in that training. One of the head of school had this to say;

We rarely conduct feedback sessions for teachers after coming back from seminars or workshops. This provides opportunity for teachers who did not attend a seminar or workshop to gain what was covered in the training. However, sometimes teachers fail provide feedback to other teacher after coming back from training because of the teaching load and other related factors. Source: (Field data)

This quote implies that heads of schools slightly took part in organizing and supporting professional development activities at school level. To support that, findings from documentary review shows that most of schools did not allocate time for teachers’ professional development practices. However, in school A and E reported to use time during remedial classes and weekends for that purpose. This was reported to be one of the reasons why teachers did not meet regularly to discuss matter pertaining teaching. The findings are in contrast with that of Owen (2005) who reported that

school administrators demonstrated positive attitude towards professional development and therefore secured release time for group of teachers to attend PD by restructuring and shortening school day on one day a week.

Meanwhile, findings from questionnaire and interview show that teachers in schools reported to engage in other learning activities that were not acknowledged by the school management. Some of the teachers accounted to use extra time within and after working hours to study different books and watching PowerPoint presentations of lessons from the internet in order to improve their teaching. Others revealed to engage in discussion with colleagues in their respective department in which experienced teachers helped less experienced one. During interview, one mathematics teacher in school C had this to say;

We have been engaging ourselves in the departmental discussion with colleagues how best we can teach physics topics that seems to be difficult. Our discussion mainly focuses on sharing experiences on how to improve our teaching and has helped us as we get immediate support from our fellow experienced teachers. Source: (Field data)

In the same vein, another teacher in school E had this to add;

Participation in school based professional development activities enables us to share the wealth of knowledge among us. Some of us attend seminars and workshop while other does not get that opportunity. I believe through meeting together we can share what we have to collectively improve our teaching. Source: (Field data)

This implies that teachers benefited from school-based professional development practices as some of them showed to have improved their teaching practices. In addition to that teachers acknowledged receiving and benefiting immediate support from their fellow teachers in the department. One of the teachers in interview divulges to improve in preparation of practical and teaching difficult topics in chemistry as result of engaging in collaborative activities with his fellow teachers. In this view, teachers who attended workshops and seminars and experienced teacher acted as mentors in the learning process within the department.

However, Findings also show that teachers were enthusiastic to participate in collaborative activities in schools and had strong belief that collaborative learning practices in schools maximizes opportunities to improve their teaching. They further strongly urged that participation in professional development activities at school level will enable them to share the knowledge they have among them. In support of that, the head of school D argued that it is essential to have professional development activities at school level considering that teachers will remain at schools and will be easy to

support them. The DQAO₂ urged that having professional development practices at school will complement out of school CPD like seminars and workshops that have been accommodating only few science teachers. The findings concur with that of Desta, Chalchisa, and Lemma (2013) which indicated that teachers detained positive views on the need for a school-based continuous teacher professional development program and as a means by which the school community collaborates to improve quality of teaching and learning.

Access to Continuing Professional Development practices

Regarding the growing concern about continuing professional development for teachers following the initial teacher training, the researchers sought to understand how science teachers’ accessed the available professional development activities. Findings from questionnaire and interview show that most of science teachers had limited access to professional development practices. See Table 1.1 for teachers’ access to professional development activities across educational level and teaching experience.

Table 3. Teachers’ Access to Professional Development Activities (N=43)

District	Access	Teachers Education level				Total (%)	Teaching experience			Total (%)
		B. degree	PGD	Dip	F. six		2≤	3-6	7-10	
1	Yes	8	1	1	0	10 (23.3)	2	3	5	10 (23.3)
	No	9	1	2	2	14 (32.6)	9	1	4	14 (32.6)
	Total	17	2	3	2	24 (55.8)	11	4	9	24 (55.8)
2	Yes	5	1	1	0	7 (16.3)	1	1	5	7 (16.3)
	No	6	0	6	0	12 (27.9)	5	7	0	12 (27.9)
	Total	11	1	7	0	19 (44.2)	6	8	5	19 (44.2)

Key: PGD- Postgraduate Diploma, ≤ - below or equal to

The table 3 shows that only 17 (39.5%) out of 43 (60.5) science teachers participated in this study accessed professional development activities, most of them being experienced teachers. Most of the professional development practices they had access to were seminars and workshops that were conducted in subject specific centre. Findings further revealed that 26 (60.5%) out of 43 S&M teachers did not have access to professional development activities, most of them with less than two years teaching experience. This finding implies that most of science teachers had limited access to professional development practices to update their content and pedagogical skills. This is against the education and training policy of 2014 that insists on teachers’ need to be exposed regularly to new methodologies and approaches of teaching consonant with the ever changing environment (MoEVT, 2014).

During interview, science teachers, HoS, DSEO and DEQA indicated similar concern for teachers’ lack of regular opportunities to access professional development activities. One of the DEQA said that:

Only few teachers get access to attend in-service training programmes conducted for science regardless of its essence in helping them to improve and develop their career which in turn adds significant value in teaching and learning process. Source: (Field data)

In the same vein, DSEO had this to say; We have been preparing different seminars and workshops in various centres in our district for the sake of providing opportunities to our science teachers to get access to professional development. However, few teachers get involved in the prepared programmes due to the limited resources we have especially funds to conduct trainings. Source: (Field data)

The findings entail that science teachers in schools are not given equal opportunity to access continuing professional development to develop teachers’ knowledge bases (pedagogical and content knowledge base). It seems that, for five years consecutively documentary findings show consistency of

teachers' lack of opportunity to attend professional development activities (see Table 4).

Table 4. Teachers' Attendance to the Professional Development activities from 2015 to 2019

District	School	Attendance	2015	2016	2017	2018	2019	Total
1	A	√	2	2	2	3	5	14
		×	1	2	4	4	7	18
	B	√	1	1	3	3	4	12
		×	2	2	2	4	5	15
	C	√	1	1	2	2	3	9
		×	4	4	4	2	3	17
2	D	√	1	1	3	3	3	11
		×	1	2	1	3	3	10
	E	√	2	2	2	3	2	11
		×	1	2	1	1	4	9
	F	√	1	2	3	2	2	10
		×	3	3	2	3	4	15
	G	√	1	1	3	2	2	9
		×	2	2	1	2	3	10
H	NP	-	-	-	-	-	-	

Key: NP= Not Provided, √ = Attended, × = did not attend

Over 50% of science teachers in selected secondary schools did not have access to continuous professional development from 2015 to 2019. In the same vein it was revealed that, there was unequal number of science teachers attending in-service training prepared in different centres across schools and districts. This is against the education and training policy of 2014 that insists on teachers' need to be exposed regularly to new methodologies and approaches of teaching consonant with the ever changing environment (MoEVT, 2014).

CONCLUSION AND IMPLICATION

In this study we sought to understand school-based continuing professional development practices and access for the intention of improving teaching and learning. Teachers' responses shows that they had limited access to regular opportunities of continuing learning as only few teachers had access to school-based CPD and those organized in subject specific centers. On top of that, the CPD practices were rarely organized hence limited chances for teachers to continue learning.

However, teachers had positive mind to participate in school-based CPD as seems to be inclusive and providing immediate support to improve practices in teaching in contrast to those organized in other places. Teachers demonstrated efforts to continue learning while working by engaging themselves in collaborative activities and self-study practices using online resources.

Basing on science teachers in-service education, it seems important that teachers have regular access to continuing professional development practices organized in schools and training centres as part of their career advancement to improve science instruction. It is crucial to develop and support in-service teachers'

professional development programmes to effectively teach their subjects to the required standard. The researchers acknowledge the use of school-based professional development practice to complement those organized in other places for the sake providing regular opportunities and on-spot support to improve teaching and learning. The government and non-government organization responsible for provision of continuing professional development for science teachers need to be well informed by policies and guidelines on their responsibility in creating favourable environment for teachers to continue learning in schools and out of schools

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