

Technology and Teacher Professional Development (TPD): the process and content of microlearning in a school-based integrated in-service teacher education (INSET) project

Prof. Muhammad Ibn Junaid – Usmanu Danfodiyo University, Sokoto, Nigeria

Dr. Betty Oganje - Commonwealth of Learning, Vancouver, Canada

Melisa Allela - Technical University, Nairobi, Kenya

Abstract

Continuing teacher professional development for all teachers across the entire school system poses a challenge in many contexts, especially in developing countries. Teachers from schools located in remote rural areas usually have fewer professional development opportunities due to the lack of accessibility either to their schools or to professional development resources. On-site school-based professional development is a viable option if innovative design is adapted to generate microlearning resources that teachers can easily access and share. This paper reports on a technology enabled school-based integrated INSET project coordinated by the Freetown Teachers College (FTC) in 12 junior secondary schools (JSS) in Sierra Leone under the COL's Teacher Futures Programme. The project represents an innovation in TPD and is different from the general type of face-to-face and exclusively paper-based in-service teacher training programme common in Sierra Leone. Under the new project a multimodal approach is used where the FTC mentors and the communities of learners (JSS teachers) are presented with both print and microlearning resources and also provided access to an eLearning platform and the use of mobile phones as the main vehicles of delivery. Microlearning is an emergent learning strategy known for its quick response in bridging skills and knowledge gaps. In the context of the INSET Project, it involves a weekly dose of pedagogical content knowledge and skills, including modelling of classroom best practices which teachers can adapt and use. The project design and methods are briefly described, but the main focus of the paper is on the microlearning component of this project and discusses the use of mobile technology in the delivery and implementation of TPD in the 12 project schools. The emphasis is on the methodological and management challenges that arise in creating and nurturing communities of practice (CoPs) in a school-based setting and how these are addressed by the various schools involved.

The INSET Programme in Context

Teachers are a critical factor in determining student learning and enhancing teacher quality at all stages of a teacher's career. It is therefore vital that countries, more particularly the developing ones, such as Sierra Leone, ensure the provision of adequate numbers of qualified and competent teachers at all levels of their education systems, as well as their continuing professional development throughout their teaching career. Teacher professional development is a lifelong, career-wide process that starts with initial preparation at the college or university and ends at retirement. As rightly pointed out by Knudsen et al. (2013), teachers have an ongoing obligation to maintain their professional expertise and must therefore, regard themselves as learners involved in the continual revision and improvement of their knowledge and skills, as well as, their teaching and learning approaches. To guarantee this, in June 2016, the Freetown Teachers College (FTC), with technical assistance from the Commonwealth of Learning (COL), developed a technology enhanced School-Based Teacher Development (SBTD) Framework for the training of Junior Secondary School (JSS) teachers in selected secondary schools in the Western Area (Freetown) and Kono District. The SBTD Framework constitutes the main strategic approach for improving the quality of teachers and teaching in the Project Schools until 2019, and its implementation is guided inter-alia by the following principles:

- Ensuring enhanced political support particularly at national (Ministerial) levels, but also at District and school levels.
- Focusing on strategic skills whose acquisition and implementation will make a significant difference in teaching and learning outcomes within the project schools and at District levels.
- Building the capacities of JSS teachers, head teachers and school champions in the project schools and the national implementation teams at the FTC (the mentors).
- Institutionalising career-long professional development and the culture of knowledge and experience sharing in professional learning communities within the project schools.
- Developing teachers' skills in the use of various technologies for teaching and learning purposes.

INSET Design and Methods

One of the project's focal areas is improving the FTC's capacity to develop and offer school-based training opportunities for serving teachers by using mobile technology to promote microlearning, as well as stimulate peer collaboration through networked learning and Communities of Practice (COPs). The learning package for the INSET programme consists of a Blueprint and Toolkit (B&T) for school-based teacher development (SBTD) and four INSET modules (Module 1: Teaching and Learning for Sustainable Development, Module 2: ICT for

Teachers, Module 3: Learner-Centred Approaches and Module 4: Commonwealth Digital Education Leadership Training in Action). The B&T serves as a foundation course on which the remaining four INSET courses are hinged and is the main document used to roll out the programme in January, 2019.

The main objective of this interim report is to review the progress made by the FTC and the project schools in the implementation of the programme and identify the methodological and management challenges that the institutions faced, more particularly in creating and nurturing communities of practice (CoPs) in school-based settings and contexts in which teachers hitherto operated independently of one another.

Methodology

This interim report is based on analyses of data collected using a combination of quantitative and qualitative methods. The quantitative data were drawn from WhatsApp data visualisation carried out on all the active WhatsApp platforms of the project schools as at 11 pm on June 9, 2019. This involved extensive analyses of the messages sent by each group (in terms of number, type, content, number of words used and timing). The qualitative data were gathered through a focus group approach conducted by one of the authors at the FTC during a workshop on mentorship involving mentors, principals and school champions held on 17 – 21 June, 2019. The focus group discussion focused on assessing the status of implementation of the INSET programme in the project schools and the challenges faced. The data gathered from the qualitative approach were substantiated by simple analyses and comparisons using available quantitative data drawn from the WhatsApp visualisation survey.

Review of Related Literature

A growing body of work catalogues the ‘off-site’ - dominated character of TPD, with important examples being (Eraut, 1994; Little, 1994; Day, 1999; Kelly & McDiarmid, 2002; Hoban, 2002; Kirk et al, 2003; Kennedy, 2005; Junaid & Maka, 2015). These studies have further illustrated the model’s narrow view of teaching and education whereby the standardisation of training opportunities overshadows the need for teachers to be proactive in identifying and meeting their own development needs. A growing recognition of this drawback has led to the growth of alternative models which are more inclusive of teachers’ development needs (for example, Broad and Evans, 2006; Orr et al., 2013; Timperley et al., 2008; Borg, 2015). This literature has attempted to extend the established views of what TPD involves to include, among other things, situating the training in schools and classrooms (‘on-site’), engaging teachers in collaborative and shared learning through communities of practice, involving teachers in the decisions on content and process of the TPD and making TPD an ongoing process rather than a periodic event (Borg, 2015).

However, attempts to implement school-based models more particularly in the developing countries, despite the advantages associated with them, have not enjoyed wide support from teachers who generally view TPD as an out of school activity that teachers should be paid to attend. This view is clearly at odds with the notion of school-based TPD that eliminates all travel and accommodation costs associated with attendance at the ‘off-site’ TPD venues and, which inadvertently are its main attraction to teachers. This particular compensation-centred ethic of the teachers’ view of TPD affects both their rating of and participation in on-site professional development activities.

But more importantly, As Kennedy (2005) points out, even among those who participate in school-based TPD, depending on the role played by the individual member of a community of practice, “learning within such a community could be either a positive and proactive or a passive experience, where the collective wisdom of dominant members of the group shapes other individuals’ understanding of the community and its roles”.

In the particular case of the INSET programme as will be seen later, it is a continuing struggle simply to keep both the trainee teachers and their mentors focused on the training, to get the trainee teachers to participate actively in the communities of practice and respond on time to the assigned tasks, and the mentors to provide prompt and constructive feedback as specified in the week by week implementation guide that accompanied the toolkit. Secondly, the issue of power and authority is so fundamental to the success of the school-based programme as active participation is predicated upon whether or not the training will lead to certification, as well as, on the value attached to that certificate by the constituted authority (in this case, the Teaching Service Commission [TSC]). The combination of these two factors produced a multiplier effect that is well articulated by both the mentors and the school champions during a recent workshop on mentorship. They reported that the teachers were not keenly involved in the programme and participated when and as they liked. Initially, they did not feel it was necessary to pay much attention to the programme and therefore many of the enrolled teachers were lackadaisical in their attitude to the programme. However, a presentation by a staff of the TSC on the importance of TPD and the place of the portfolio in the promotion guidelines of the Commission at a leadership training held at the FTC in March, 2019 involving head teachers and teachers from across the project schools gave a whole different outlook to the programme. Suddenly, the project schools witnessed dramatic rise in the rates of participation of teachers in the CoPs.

Another dimension of power relations and control over the INSET programme came to the fore when in one of the project schools the principal tried to jettison the programme by discouraging and even attempting to stop the teachers from participating in the activities of the programme. In this instance, it was the keen interest and determination of the school champion and the enrolled teachers that prevailed over the sinister motive of the principal. The teachers made it quite clear that they were interested in the programme and that nothing could stop them from participating in it. In the second case it was true, however, that despite several efforts made by the assigned mentor and the project focal person, including visits to the school, the principal and the school champion were not particularly interested or involved in the programme and made it impossible for the community of practice to take place at their school. Consequently, the school did not take part in the ongoing implementation of the INSET programme which started in January, 2019 thereby reducing the number of participating schools to 11 from the original 12 that attended the roll-out seminar.

Whilst the gradual integration of the 'in-school' TPD models into mainstream practice may continue to occasion mistrust within some circles (including teachers themselves) – albeit for selfish reasons in some cases – it has nonetheless, resulted positively, in a renewed effort to change TPD structures and practice from within, as illustrated by the case of the INSET programme.

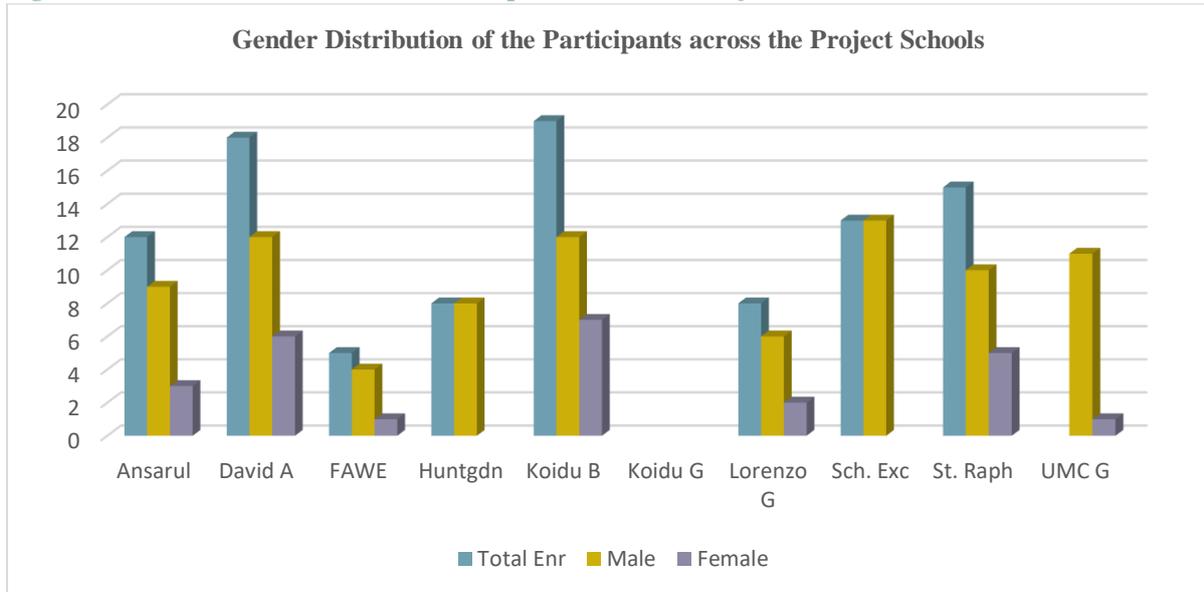
The Microlearning Process and Content

The INSET programme was rolled out in January, 2019 with the implementation of the SBTD Toolkit and was supposed to run for sixteen weeks. An implementation guide outlining the step-by-step processes of implementation of the toolkit was developed and used for the training of the key actors (mentors, principals, champions and teachers) prior to the roll-out of the programme. The guide also provides a week-by-week implementation plan that outlines the content of the Toolkit that are to be covered. Mentors at FTC facilitated the implementation of the programme from their base at the college using mobile phones and are supposed to provide prompt and effective feedback, as well as, an extensive backup programme of visits and meetings with principals and teachers of the project schools. The SBTD Toolkit contains sessions on why teachers need to engage in professional development, how to make learning more active, how teachers can improve their school and subject knowledge, how they can improve the teaching of their subject, how to use the local environment, or involve parents/guardians in their children's learning and how teachers can continue to develop professionally.

The structure of the toolkit lends itself easily for use in mobile learning. Each section of the toolkit starts with a question – a task that can be posed to the participants to engage them in collaborative learning either face-to-face or virtually, which is then followed by a general **commentary** on the issues involved and **activities** that teachers can try out with their classes. There are also some descriptions of **other teachers' experiences** to provide further guidance for the participants. The toolkit also provides a series of **key resources** that address aspects of the questions the participants will be seeking to answer. After each Question the **key resources** most relevant to the issues examined are listed.

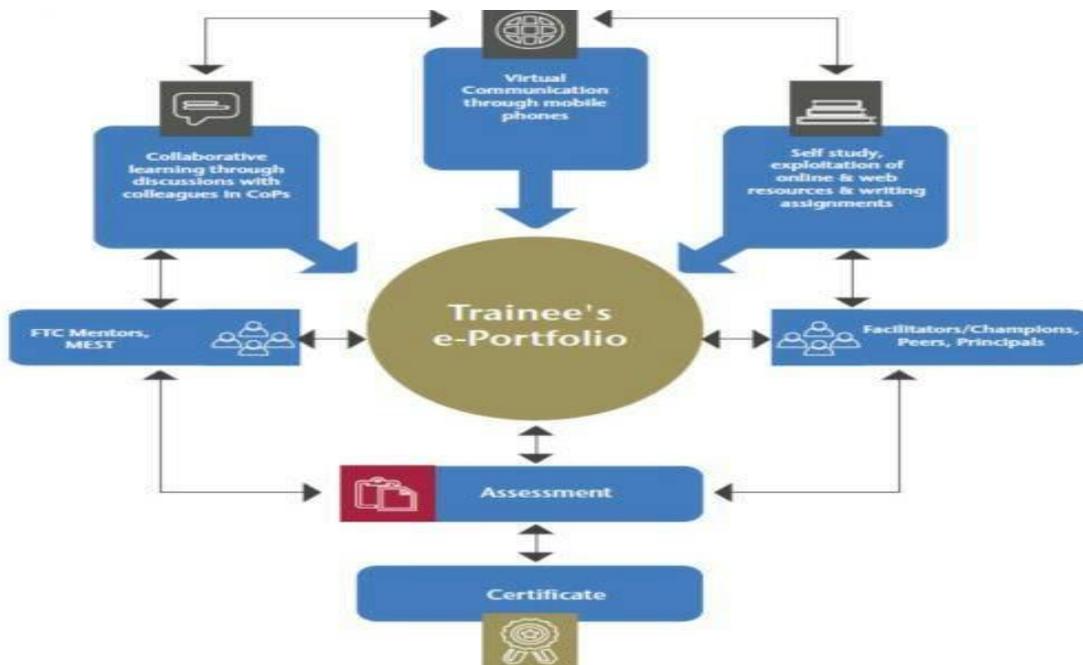
Each project school has set up a school-based CoP for the INSET Programme comprising teachers from across the subject areas. The sizes of the CoPs varied from school to school and ranged from 5 teachers at FAWE JSS in the Western Area to 19 teachers at Koidu Boys JSS in Kono District (Table 1). Each CoP has created a WhatsApp group connecting members to each other and to their assigned mentor at the FTC. The WhatsApp platform serves as the main medium for communication between the CoPs and the mentors and all teaching and learning take place virtually through this medium. The gender distribution of the participants is shown in Figure 1 below. There are more male participants than female across the 11 schools.

Figure 1: Gender Distribution of the Participants across the Project Schools



The CoP is the bedrock and the nerve centre of the INSET programme; it is where the process of microlearning takes place. It is a forum for exchange of ideas and examples of good classroom practice through collaborative learning involving teachers learning together and from one another. In the case of the INSET programme the process of microlearning is clearly illustrated by Figure 2 below:

Figure 2: Learning in Communities of Practice (CoPs): The main ingredients



Adapted from: Knudsen, et al. (2013) School-Based In-Service Teacher Training in Montenegro

In the model illustrated in Figure 2 above, the JSS teachers (**trainees**) receive information from FTC mentors (**experts outside the school**) virtually (**via mobile phones**), leading to collaborative learning through discussions with colleagues in the (**CoPs**) as well as, through individual **self-study** and completion of assessment tasks and assignments. The results are gathered in the trainees' **electronic portfolios** that contain the proven competence

and improved practice of the trainees, which are then **assessed** by the FTC mentors, the school champions, head teachers and peers leading up to **certification** once the assessment is verified as complete.

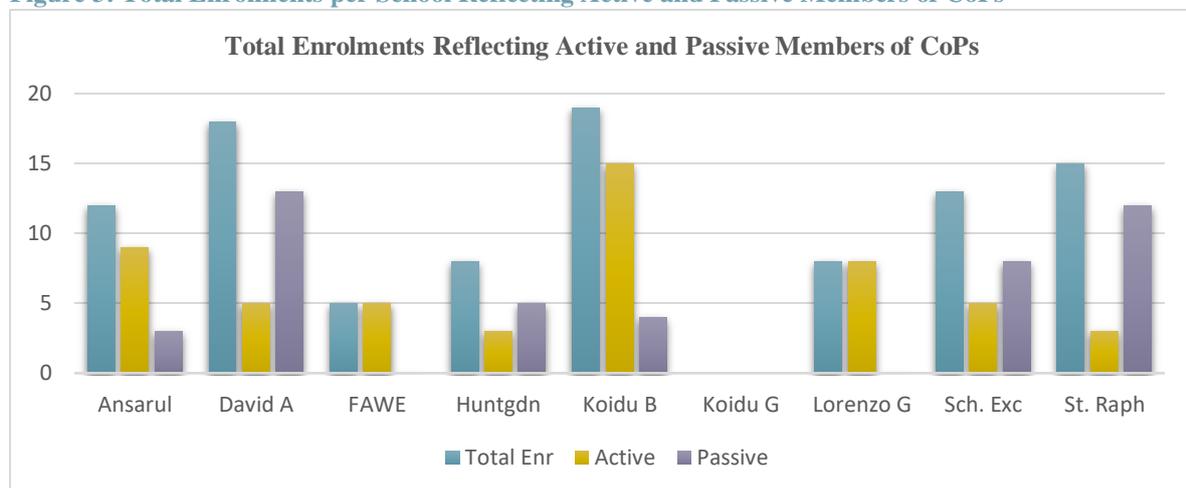
Issues and Challenges affecting the successful implementation of the INSET Programme

From the perspectives of the mentors, principals and the champions engaged in the implementation of the programme, the following common key issues affecting the implementation process can be identified:

1. The issue of Fidelity to the Implementation Plan and challenges faced

Overall, the plan is being implemented as planned with 12 out of the 14 selected schools participating in the programme, albeit, at varying levels of progress. The selection processes adopted by the schools adhered to the related components of the INSET’s Framework for participation: voluntary enrolment, ownership of smart phones, (though in some instances the enrolees did not have such phones) and head teacher’s approval, which together constitute the main approach to the selection and participation in the programme. As should be expected with any new and voluntary venture, the sizes of the CoPs across the schools were varied much as the levels of participation of the enrolees in the programme were as can be seen in Figure 3 below. Overall, there were as many active members (58) as there were passive members (52), with Koidu Boys JSS having the highest number of active members (15) representing 79% of the school’s total enrolment on the programme and Huntingdon JSS and St. Raphaels JSS having the lowest numbers (3 each) representing 38% and 20% of their COPs’ enrolments respectively.

Figure 3: Total Enrolments per School Reflecting Active and Passive Members of CoPs



Nevertheless, the level of enthusiasm and interest in the programme among the teachers was very high across the 11 schools as revealed by the school by school analysis of participants’ sentiment. Figures 4 and 5 below are the results of the analysis for the School of Excellence in the Western Area and Koidu Boys JSS in Kono District. As can be discerned from the two charts, the emotions of the teachers were generally encouraging, with very high levels of positive disposition, trust, joy and anticipation as opposed to anger, disgust, sadness and negative disposition. This can be illustrated by the following quote from a mentor about the CoP in one of the schools assigned to him:

“The members in the Community of Practice are really interested in the programme. Some call to tell me their interest in the programme. All of the 8 members of the group have at least answered a question out of the six (6) questions we have completed so far. That means all the members have made contributions to the questions posted. The school champion is also very active in persuading his colleagues to send their answers to the group.”

Much of the teachers’ antipathy towards the programme is rooted in two main concerns: uncertainty about whether or not the programme will lead to certification and lack of incentives for the participants. In the vision of the teachers all in-service training of teachers should lead to certification of value to them and that teachers should be incentivised to attend such training.

Figure 4: Total Sentiment Score School of Excellence (WA).

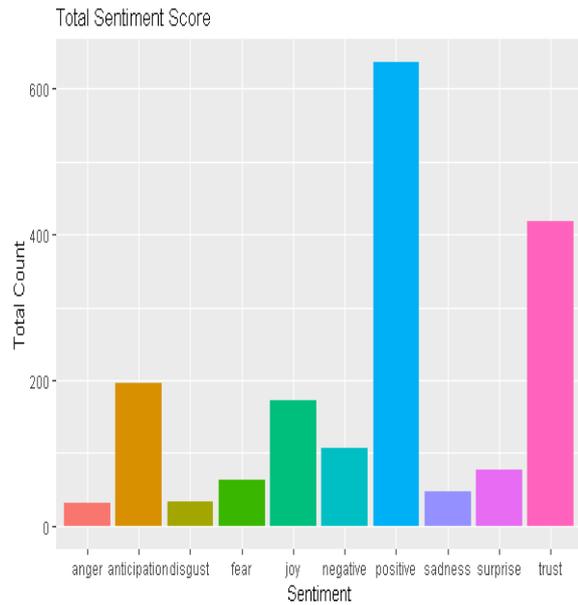
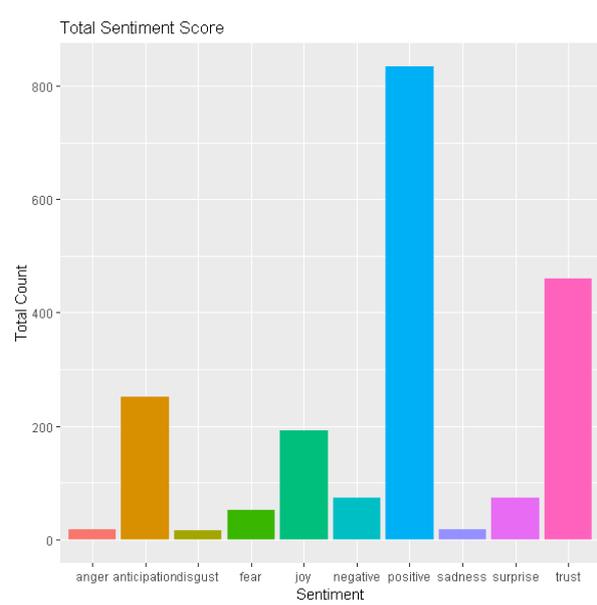


Figure 5: Total Sentiment Score for Koidu Boys, JSS, Kono District



The results of the school by school analysis of the INSET related messages sent and the number of words used by each school as at 11 pm on June 9, 2019 were also quite revealing (Figures 6 & 7). The number of messages sent including the deleted ones ranged from 21 at Peninsula JSS to 342 at St. Raphael’s. This confirms that microlearning did take place between members of the CoPs and the mentors at the FTC during this period. The messages also included some media ranging from 5 at Peninsula to 52 at St. Raphael’s. The analysis of the content of the messages also revealed the status of implementation of the INSET programme at each school. Whilst some of the schools (for example, Huntingdon [Q10], Baptist [Q9], St. Raphael’s [Q8], Ansarul [Q9], Lorenzo Gorvie [Q9]) have made considerable progress in the implementation of the SBTD Toolkit illustrated by the number of questions they have covered, others (David Arnold [Q3], School of Excellence [Q5], FAWE [Q6]) are still moving at a slow pace despite the fact that the programme was rolled out in all the schools at the same time, with Peninsular JSS being the worst hit as according to both the assigned mentor and the project focal person, “nothing seems to be going on there.”

Figure 6: Baptiste -WhatsApp Log

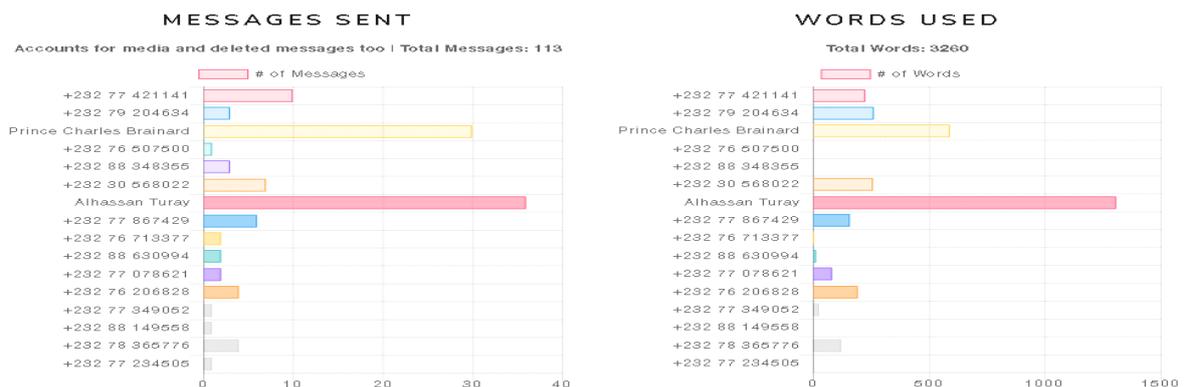
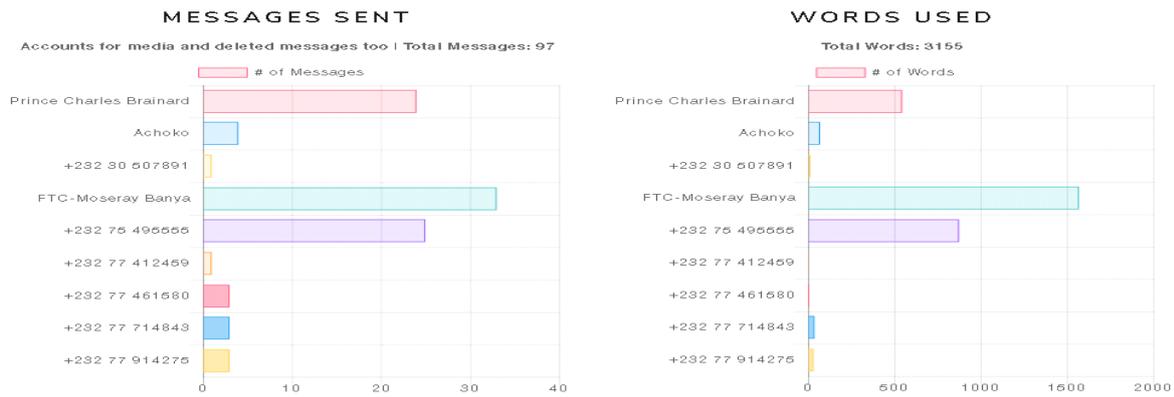


Figure 7: Koidu Girls JSS -WhatsApp Log



Notwithstanding these positive developments, however, a number of the taken for granted assumptions of the INSET programme did not work out as planned. These include:

The issue of Timing

First, the assumption that daily exposure to 15-30 minutes timeframe is sufficient for trainee teachers to improve on their professional practice did not go very well with the teachers as many of them needed and actually spent more time on preparation before posting their responses to the questions on their respective WhatsApp platforms. Many of them felt as if they were under examination and wanted to prepare well before sending in their contributions. The differing timings used by the teachers can be seen from a sample of the results of the school by school analysis of the timing of the messages sent represented in the following Figures 8 and 9. It is interesting to note that even in the school with the most active participants (Koidu Boys), the statistics reveal a wide variety of timing spanning over 23 hours. This does not however, reflect the time lost from when a particular question/task was sent by the mentor to the point of responding by the individual members of a CoP, which may amount to days. Nevertheless, it does mirror both the flexibility of the approach and some of the challenges involved. It also slowed down the process of horizontal learning because at the time some members sent their contributions (in the wee hours of the night) others were fast asleep. This can only mean one of two things: either that the groups have not mutually agreed on an appropriate time for the CoP, or that members did not respect or commit themselves to the agreed time.

Figure 8: Koidu Boys JSS School -WhatsApp data

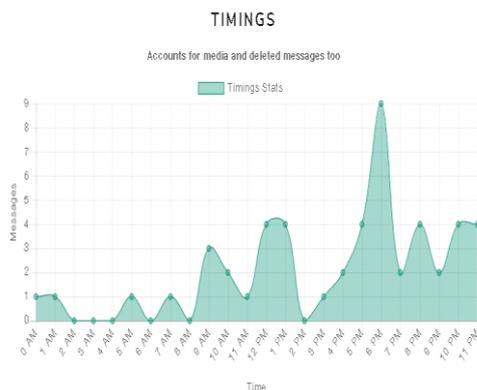
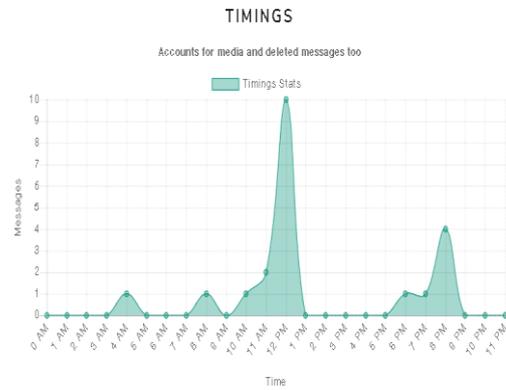


Figure 9: Peninsula JSS -WhatsApp log



The issue of Scheduling Microlearning

Secondly, whilst the programme lays more emphasis on virtual learning, all the schools opted for physical rather than virtual meetings for the CoPs, which inexorably created undue delays for holding the CoPs due to the conflicting time budgets of the teachers. In other instances, the time set for the meetings (2.30 pm) is not

convenient for all teachers as many of them are rushing to go back home after school hours further compounding the problem and at the same time undermining the flexibility of microlearning.

The Exclusive use of the WhatsApp Platform

Again, the exclusive use of text messaging and the WhatsApp platform as the main mode of delivery also undermined one of the principal components of the programme - the requirement that each trainee should create and develop an e-portfolio containing his/her assignments and examples of good practice - thereby rendering the implementation process incomplete. Thus, whilst a good number of the schools have almost completed the implementation of the Toolkit, none of the teachers have created and developed e-portfolios, which could serve as the main bases for assessment of the work done more particularly, the individual reflections of teachers on how the learning episodes have improved their knowledge and practice and the much revered certification. This leaves the schools and the FTC with no records of the individual work accomplished so far other than what can be derived from the posts on the WhatsApp groups. The on-line component of the programme which would have facilitated the creation and development of e-portfolios by the individual members of the CoPs is ignored by this exclusive use of the WhatsApp model.

The issue of the Relationship between the Mentors and the Teachers

In principle, microlearning is supposed to foster genuine collaboration between mentors and teachers in a shared control and supportive manner, with both parties committed to the mutually agreed implementation plan. At the level of implementation, however, some lapses on the part of both parties were observed. In the foregoing discussion the lapses on the part of the teachers were highlighted. In this section, attention will focus on some of the lapses observed on the part of the mentors, which have helped to undermine the effectiveness of the collaboration between them and the teachers. In some instances, for example, the mentors were not prompt in sending feedback and in one instance the feedback sent was of the one word type, such as “good” despite the availability of readymade commentaries on the questions in the Toolkit provided to the mentors; yet in other cases the questions and tasks stopped coming from the mentors leading to pleas from the teachers for more questions to keep them busy on the programme.

There were also cases of mentors sending more than one question at a time to the teachers in their bid to make up for the lost time. A most striking incidence was when a mentor lost track of where the group was in terms of implementation of the Toolkit and sent them a question they had already answered and was quickly reminded by the school champion that the group had treated the question. All these and the aforementioned teacher-related lapses are but clear indications of the existing implementation gaps that need to be bridged in order to pave way for the successful implementation of the INSET programme.

The issue of Monitoring

The above mentioned lapses also illustrate a clear case of insufficient monitoring of the programme both at the college level and the level of the mentors. Current levels of engagement of mentors with the teachers across the project schools are low thereby limiting mentors’ ability to monitor the programme effectively.

Conclusion

However, notwithstanding the above mentioned challenges, there are positive indications that the notion of using technology to deliver CPD in a school-based context and to improve teaching and learning is gaining considerable currency in the project schools. All the 11 out of the 12 project schools participated in the programme, albeit, at varying degrees and levels of accomplishment. There is a growing acceptance in these schools of the new approach to CPD and willingness on the part of the principals to provide the necessary support to their teachers for their active participation in the programme. Two examples stand out here for mention.

The first is the case of the Koidu JSS in Kono District where the principal served as a guarantor for his teachers to get mobile phones on credit from a vendor to be paid in instalments deducted from their monthly salary. The second is the case of the Baptist JSS in the Western Area where the principal made a presentation on the INSET to the school’s Governing Board which graciously approved funding for the INSET programme that made it possible for the teachers in his school to buy mobile phones and data for the community of practice. These two cases are unprecedented and they represent some of the opportunities available for the successful implementation and sustainability of the INSET programme. The other opportunities include the prominence given to teacher professional development in the ongoing national teacher education reforms and the emphasis being laid on the importance of keeping portfolios of professional development by teachers by the Teaching Service Commission as a necessary condition for promotion.

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