

*Learning From the Ground: How Mathematics Teachers View Collaboration
Through the Learning Action Cell Program*

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Abstract

Teacher professional development is as important as the education of students in schools. The Professional Learning Community (PLC) is one of the effective bottom-up strategies for professional development as it gives teachers opportunities to collaborate and share experiences and expertise, rather than merely receive knowledge from an expert outsider. The Learning Action Cell (LAC) is the Philippines' version of the PLC and it highlights the teachers' best practices and real-life classroom experience as their source of knowledge. This paper presents mathematics teachers' conceptions about the professional development strategy which was introduced concurrently with the K to 12 curriculum last 2016. In the study, 53 secondary school mathematics teachers articulated what they perceived as benefits of the strategy, which include gaining new knowledge, learning about innovations, and developing uniform classroom materials. Mathematics teachers also valued some intangible benefits such as the act of sharing experiences and having others work with them collaboratively on problems. The paper discusses these within the broader concept of teacher collaboration and uses the perspective of dialogic relations to identify challenges for school leaders and teachers. Moreover, several issues regarding enforcement of the new program have emerged, such as the lack of awareness of some teachers about the program and their reluctance to participate in the LAC. This study aimed to unveil the potential of the LAC to improve the professional development landscape of the country as well as identify possible solutions to issues related to implementation that have surfaced.

Keywords: Professional Learning Communities, Learning Action Cell, Bottom-Up Approach, K to 12 Curriculum

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Introduction

It has been almost a decade since the new K to 12 Program was first introduced by the Philippine Department of Education (DepEd), beginning with its implementation of the universal Kindergarten in school year 2011-2012, the rollout of the new curricula for Grades 1 and 7 in school year 2012-2013, and finally with the introduction of the two additional grades (11 and 12) in school year 2016-2017. Formally called *Enhanced Basic Education Act of 2013*, the Philippine K to 12 Program has a few vital features - the addition of Grades 11 and 12 as part of the compulsory pre-university education for all Filipino students, the implementation of the Mother Tongue-Based Multilingual Education in Grades K to 3 and the introduction of specialized educational tracks in Grade 11. It is “arguably the most comprehensive basic education reform initiative ever done in the country since the establishment of the public education system more than a century ago” (Message from the DepEd, SEAMEO INNOTECH, 2012).

As with any educational reform that involves a major curriculum innovation, one of the most important concerns about the Philippine K to 12 Program is teacher preparation and professional development. In their analysis of opportunities for mathematics teachers’ professional development and growth in the Philippines, Verzosa, Tulao-Fernando and Vistro-Yu (2017) found that the existing annual in-service program for teachers (INSET) is severely limited when it comes to helping mathematics teachers develop their teaching skills. For one, since the INSETs are intended for teachers of all subjects, the content focuses are assorted and do not concern mathematics teaching directly. Hence, mathematics teachers feel a great dissonance between the INSET and their specific needs.

DepEd recently institutionalized a new professional development program for school teachers in support of the K to 12 Program. The *Learning Action Cell (LAC)* is a school-based continuing professional development strategy aimed to help teachers develop new skills and knowledge needed for improving teaching and learning. It has the potential to become the key professional development program for teachers if implemented correctly because it “primarily functions as a professional learning community for teachers that will help them improve practice and learner achievement” (Department of Education, Order No. 35, s. 2016). DepEd cites the LAC as only one of few bottom-up teacher professional development programs, making it a new alternative to the many top-down teacher professional development programs that have dominated teacher education in the Philippines for the past four decades. More importantly DepEd highlights the collaborative nature of the LAC, stating in its policy that “key aspects ... are ongoing collaborative learning or problem solving within a shared domain of professional interest, self-directed learning, reflective practice leading to action and self-evaluation, and collective competence” (Department of Education, Order No. 35, s. 2016, p. 3).

This paper has two goals. First, it discusses the intended nature of the LAC and describes various aspects that make it a potentially key program for teachers, particularly for Junior and Senior High School mathematics teachers. Second, the paper presents mathematics teachers’ perspectives of the LAC, focusing on teacher collaboration as a key feature of the LAC strategy and thereby doing right the DepEd claim of the LAC being a bottom-up professional development program. Finally, this paper identifies a specific challenge for both DepEd and its teachers for a successful implementation of the DepEd Order in as far as what the authors have unearthed from their initial study.

Professional Development for Teachers

The professional development of teachers is as important as the education of students in schools. As teaching is an intelligent, knowledge-based activity and yet, diverse, and complex (Hegarty, 2000), continuous professional development for teachers must be well-placed alongside any educational reform or innovation. Certainly, teachers are the key to students' learning of mathematics. The quality of their knowledge and skills impact on their students' learning, performance, and achievement. Teachers' professional development activities, though of uneven quality, are meant to help teachers learn more, keep abreast of new knowledge and developments in their field and improve their skills in handling students, among many other concerns.

What Knowledge Do Mathematics Teachers Need?

One of the common goals of professional development programs for teachers is to help them gain more knowledge in order to become better in their teaching. But, what kind of knowledge do teachers really need? In mathematics, attempts to describe and capture the kinds of knowledge that teachers bring into the classroom have been made, beginning with Shulman's (1986) pedagogical content knowledge (PCK), Mishra and Koehler's (2006) technological pedagogical content knowledge and Ball, Hill and Bass' (2005) mathematical knowledge for teaching. The knowledge components organized under each of these labels reflect a composite of various educators' and researchers' understandings of the aspects of mathematics teaching that have been observed to positively influence students' learning of mathematics.

Locally, the Philippine Council of Mathematics Teacher Educators, Inc. (MATHTED) has also lent its hand in formulating a framework that could help redirect mathematics teacher education efforts in the Philippines. MATHTED envisioned the following to comprise mathematics teachers' knowledge and skills for teaching: mathematical content knowledge, mathematical pedagogical knowledge, general pedagogy and management skills and mathematical disposition and professional development (SEI-DOST and MATHTED, 2011). For MATHTED (2011), a fully competent mathematics teacher is someone who "possesses a strong mathematical content knowledge, is armed with mathematical pedagogical knowledge as well as general pedagogical knowledge and management skills, displays an appropriate mathematical disposition and values one's own professional development" (p. 11). Subsequent teacher education programs and professional development initiatives in the country have more or less worked within this framework.

How Do Teachers Validate and Communicate Their Knowledge?

Teachers have a different way of validating what they know and believe about mathematics teaching and learning (Lester and William, 2002, p. 2). Teachers also have varied ways of communicating and engaging in discourse, often relying on personal judgments and social conversations to determine what works for them (Hargreaves, 1998; Lester & William, 2002). These realities might explain why educational research seemingly have minimal impact on teachers' instructional practices. Schwandt (1995, 1996, as cited in Lester & William, 2002) has suggested that while researchers communicate with each other by using arguments to justify claims, teachers tend to communicate from a dialogical perspective, which hinges on "conversational forms of interaction" (Schwandt, 1996 as cited in Lester & Williams, 2002) in developing one's knowledge and practices. It is with these views that

teacher professional development programs must be planned and organized in order to have an impact on teachers' knowledge and practices. This rationalizes the need for valuing teachers' working together to broaden and deepen their knowledge for teaching. Teacher collaboration, indeed, has its place in developing teachers' knowledge about teaching and learning.

The Learning Action Cell

DepEd continually supports the professional development of its teaching personnel through various programs to improve the teaching-learning process. However, most of these efforts are characterized as top-down processes in which curriculum experts, researchers or professors share or transfer knowledge through seminars and workshops. There are few instances of bottom-down professional development where teachers study the pedagogy and content, create a lesson study, or conduct action research as a group (Department of Education, 2016). There is little opportunity for teachers to utilize the rich experiences acquired from their encounter with students and, most especially, the knowledge they create in collaboration with other teachers. The Learning Action Cell (LAC) is a group of teachers working collaboratively to solve shared challenges in the school as facilitated by their school head or a LAC leader. The LAC is DepEd's take on the Professional Learning Communities (PLC) which aids teachers in constructing knowledge about teaching or revising traditional beliefs about teaching, learning, the community, and education to address the present needs of the learners (Little, 2003).

Figure 1 shows the LAC framework. DepEd recognizes that the quality of learning is influenced by the quality of teaching. The framework shows that community of practice or LAC supports teachers in collaborative activities -- planning, problem solving and action implementation -- that will lead to an improvement in their knowledge which hopefully will translate to better student learning and development (Department of Education, 2016).

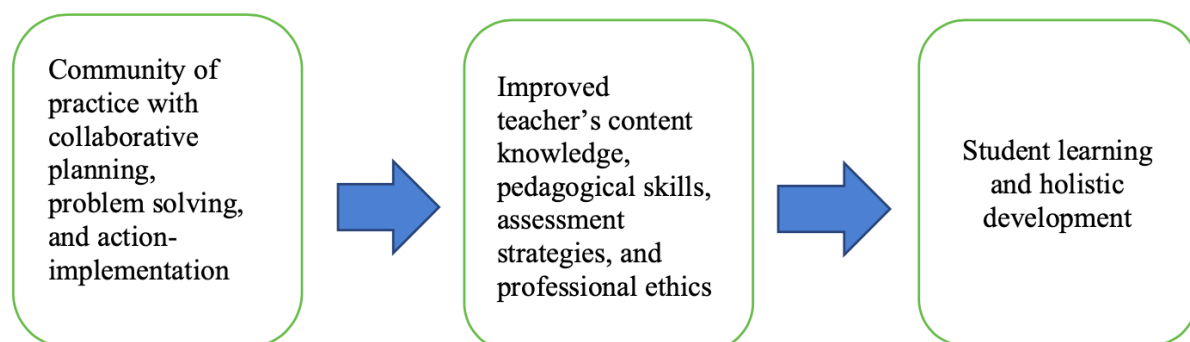


Figure 1: The Learning Action Cell Framework

The LAC process starts with the assessment of needs or the identification of the problem to be addressed. These may be captured through diagnostic tests, classroom observations, critical reflections, student assessments, and other forms. This information guide the LAC leaders in determining the topics for the LAC according to the following broad categories: 1. Learner Diversity and Inclusion; 2. Content and Pedagogy of the K to 12 Basic Education Program; 3. Assessment and Reporting in the K to 12 Basic Education Program; 4. Twenty-first Century Skills and ICT Integration in Instruction and Assessment, and; 5. Content Contextualization, Localization and Indigenization. These topics are also the main thrusts of the new K to 12 curricula.

After assessing the needs, the members of the LAC are identified. The role of the school head or the school principal as the LAC leader and facilitator is vital in its implementation since s/he is tasked to ensure that the conduct of the LAC is established, maintained, and sustained. S/he also takes the lead in evaluating the effect of the LAC in schools. One LAC could be composed of five to fifteen members. Once the composition of the LAC is determined, human and material resources are procured and set up. The priorities set out by the LAC are implemented using a variety of activities such as lectures, practicum, workshops, and development of instructional materials followed by a collaborative discussion by the members on what to implement in their classrooms. When the intended activity is completed, the LAC members evaluate and prepare reports, citing in particular any improvements made by their students.

Mathematics Teachers' Perspectives

In order to learn more about how the LAC is currently being implemented, secondary school mathematics teachers from one of the more active and progressive School Divisions in Metro Manila were surveyed about their knowledge and participation in collaborative activities in general and in the LAC in particular. This division consists of 10 public secondary schools. A total of 140 public school teachers were sent letters of invitation to participate, of whom 99 agreed to participate in the study by submitting the accomplished survey forms that included their implied consent. Incomplete forms were discarded resulting in only 53 teachers as participants for this initial study. Forty of the 53 teachers are between 30 and 50 years of age and 30 teachers have pursued further studies beyond their bachelor's degrees. All of them except for seven teachers indicated involvement in academic or professional activities outside of their academic classes. Of the 53 participants, 29 of them are female.

Teachers' Ideas of Collaboration

In general, mathematics teachers see the importance of teacher collaboration in improving instruction and increasing student learning. Their ideas on teacher collaboration are categorized into three themes: purpose of teacher collaboration, aspects of a teacher's work, and the intangibles.

Purpose of teacher collaboration. Mathematics teachers recognize the need to collaborate in order to gain new knowledge and skills, as well as to enhance existing ones, as collaboration facilitates the sharing of ideas, experiences and expertise. They find the seminars and trainings incorporated in the collaborative activities to be helpful in developing their content knowledge and improving their teaching skills, particularly in "getting more ideas or strategies in teaching specific concepts". Through collaboration, teachers are able to help one another "in promoting academic excellence in teaching and learning mathematics."

Collaboration also allows mathematics teachers to work together in accomplishing the tasks needed to achieve their goals, such as improving students' achievement and school performance through effective instruction and efficient carrying out of tasks as teachers. Tasks can be delegated to several teachers to maximize time and effort in order to produce quality outputs. For instance, the collaborative development of lesson plans and assessments allows them to discuss common lesson goals, how to achieve these goals in terms of learning strategies and assessments, and ways to optimize their varied abilities and expertise in accomplishing the tasks required of them.

Aspects of a teacher's work. Mathematics teachers find collaboration important in different aspects of their work: lesson planning, classroom management, technology integration, improving content knowledge, and differentiating instruction for varied student ability levels. Meeting with colleagues regularly to discuss the pacing of the lessons and appropriate activities facilitates the development of lesson plans, of which teachers are required to submit weekly to their supervisors.

Learning new ways of integrating technology in instruction can best be facilitated through the sharing of knowledge and expertise during collaborative activities. According to one participant, "young/new teachers can share the latest and innovative technologies that will help seasoned teachers in teaching mathematics to millennial students." Teachers also learn from one another how technology may be used to maximize student engagement.

Several mathematics teachers expressed the advantage of collaboration in improving their content knowledge and skills, such as problem solving and integrating different learning areas within mathematics or mathematics with other subject areas. Difficulties encountered related to content may also be addressed through activities where teachers share their expertise and experiences.

One important concern of many teachers is how to teach a class of varying ability levels and/or learning styles. Note that class sizes of Philippine public schools are large, with each class consisting of at least 40 students and could have as many as 70 students. Classroom management and teaching students of different ability levels and learning styles have been very challenging to teachers. Collaborating with fellow teachers to learn how to deal with such challenges becomes very important. Sharing strategies and learnings from other teachers on "how to deal with student behavior" and on how to "teach mathematics to at-risk students or below average students" is welcomed by most, if not all, teachers.

Intangibles. The mathematics teachers expressed other ideas on the importance of collaboration that are worthy of discussion, ideas that they value as a result of the collaborative processes that they have experienced. The most commonly mentioned idea is the act of sharing experiences, strategies and techniques that teachers find valuable in their professional development. There are "ideas that are best shared and known" and cannot be kept to one's self. Also, it is not just from the sharing of others that one gains but also from the sharing of one's own experiences that one develops professionally and personally. Working with fellow teachers is another highly-valued process that teachers consider to be important in their development. Seven teachers cited the common idea that "two or more heads are better than one". This illustrates the importance that teachers place on collaboration as a means to achieve their goals either in the classroom or of their professional and personal development.

Teacher's Perspectives of the LAC

The mathematics teachers' awareness and involvement in the Learning Action Cell (LAC) were surveyed and identified. Twenty-seven of the 53 teachers indicated that they are aware of the LAC, as mandated by the Department of Education. Of the 27 teachers who know about the program, 24 have been involved taking on various roles: three teachers have taken on the role of leader, one teacher has served as recorder, and the rest have been participants. The teachers come from 10 different schools, seven of which have at least one teacher

involved in the LAC while the teachers from the remaining three schools had no knowledge of it.

Of the 26 teachers who were not aware of the LAC, 14 teachers expressed their interest in wanting to know more about it. Only 11 teachers would like to involve themselves in the LAC. Six of the 14 teachers who wish to know more about it do not want to be involved.

All 24 teachers who have been involved in the LAC expressed that they benefitted from their participation in the program. Learning new strategies and developing their content knowledge, as well as updating themselves of new innovations in instruction and the use of technology, were among the frequently mentioned benefits. Teachers found the interaction during LAC sessions very fruitful because they were able to gain new ideas on how to improve their teaching and to become familiar with recent developments in the use of ICT platforms that can be specifically applied in the mathematics classroom. Teachers who are new in the profession also benefitted much from the experiences and expertise of the more experienced teachers.

The collaborative nature of the LAC allowed teachers to discuss issues and problems encountered in the classrooms, particularly on the varied student learning styles and abilities, and to share strategies that helped them resolve these issues. Teachers were able to “discover new teaching strategies suited for the needs of my students”. The LAC also “gave me more opportunities to adjust my teaching styles” to cater to different student ability levels and interests.

Teachers also found that their efficiency and productivity have improved through the development of a unified daily lesson log (DLL), “uniform” lesson plans, and “parallel” tests, performance tasks and projects. By collaboratively working on their lesson plans and assessments, teachers are able to manage their time and effort towards other important responsibilities, such as taking care of their students. The LAC sessions also helped to remind them of the pacing of their lessons in order to abide by the curriculum objectives and schedule. According to one teacher, involvement in the LAC program “encourages critical reflection amongst teachers and increases their understanding and knowledge of the curriculum and classroom practices.”

Conclusion

DepEd identified the LAC to be a bottom-up professional development strategy for teachers, yet only about half of the participants are aware of it. This result begs the questions of how efficiently this order was disseminated and how much groundwork was done to initiate and push for its implementation to be answered. It also appears that there are other challenging realities that teachers face, prompting a few of them to outrightly indicate that they do not want to get involved in the LAC. One wonders what supporting mechanisms are provided to encourage and enable teachers to form their own learning cells.

It makes full sense to hear from teachers, in this case secondary school mathematics teachers, and to find out their views and perspectives of this initiative. One of the major complaints by the sample of mathematics teachers in the study by Verzosa, Tulao-Fernando and Vistro-Yu (2017) of the INSET was that they did not have any input on the design and organization of the INSET activities. As a result, there were many incongruities between the content of the activities and the specific needs of the teachers for their classroom practices. The DepEd

Order was released in 2016 and as far as the authors have gathered, not all school divisions have active learning cells. Teachers' views on this mandated strategies are important to note so that school division heads and subject supervisors may be guided in their implementation of the LAC. DepEd will do right by hearing from the teachers at this juncture, while it is still 'early', as they are the direct beneficiaries of the LAC. Teachers have to be given a voice to express their thoughts and perspectives on this novel initiative. The shortcomings of past DepEd programs must never be repeated.

The mathematics teachers' responses indicate a positive view of the LAC. The benefits that were mentioned, though quite general at this point, are important to note. Acquiring new knowledge (pedagogical content knowledge, content knowledge, technological pedagogical content knowledge – in that order), learning innovations and producing uniform learning materials appear to be the most important. Secondary to this, but perhaps, equally as crucial if not more, is hearing about other teachers' practices and experiences. The LAC provides mathematics teachers with a way to validate and communicate their knowledge of teaching and learning through the acts of sharing experiences and working together with fellow teachers as opposed to having an 'expert impart knowledge to them', which is the usual mode of top-down professional development programs. Teachers value these acts that stem from their actual involvement in the educative process, as well as in their professional development. This is consistent with Schwandt's (1995, 1996, as cited in Lester & William, 2002) suggestion that teachers tend to communicate through conversations, which help them build knowledge of practices. It is not just knowing what or knowing how that teachers look for, but as well, knowing from their fellow teachers who have the same struggles in teaching mathematics to students as they do (Shotter, 1993 as cited in Lester & William, 2002).

The collaborative nature of the LAC allows for social relationships to flourish, from which practical knowledge that only teachers understand could emerge. Collaboration in the LAC then has to be nurtured and kept healthy. This is a challenge for both DepEd leaders and the teacher participants of the LAC. DepEd leaders must ensure that wholesome professional and social relationships are maintained and supported by providing safe work spaces, appropriate materials and efficient, non-threatening monitoring mechanisms. Teachers, on the other hand, need to contribute their own wealth of ideas and experiences with fellow teachers in order to strengthen the bonds amongst themselves.

The success of any major educational reform relies heavily on the support structures that are built around it. These structures include development programs for all personnel, physical infrastructures, mechanisms for acquiring new materials and technologies, and policies and directives from the governing bodies. While these structures may be in place, however, there must be sustained efforts to keep these structures together by those both from within the educational community as well as from other stakeholders outside of the said community.

The LAC is a worthy program because it is school-based and not separate from the teachers' realities but, more importantly because it encourages collaboration among teacher participants. The LAC strategy needs the proper support of education leaders, teacher educators and researchers. By recognizing that teachers are not mere objects of research nor simply 'beneficiaries' of programs but the main actors, academic experts would do well to allow the LAC to grow. The LAC could potentially change the teachers' professional development scene in the Philippines for the better.

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