

## Leading Impactful Professional Learning Communities

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It is well known that context shapes how leadership is exercised, and once again the context of the current world situation brings along with it new challenges that bear upon leaders in every segment and layer of all societies in the world. Notwithstanding the cliché ‘*Change is the only constant*’, the world has now grown to become increasingly fluid, disruptive and uncertain – thanks to a large part to the growing accumulated applications of technological advancements and innovations such as in the area of automation, mechanization, robotics, smart devices, artificial intelligence, and nanotech. However, among these, the *Internet of things* or ‘internetization’ has been the significant underlying contribution to many of the disruptions. Terror networks have made ‘good’ use of social media with much success to spread lone-wolf type of terrorism. Organizations are constantly on their toes to prevent cyber hackers from infiltrating their systems. Traditional businesses have to reckon with the *sharing economy* or *collaboration economy* such as Uber and Airbnb.

Internetization have also had a tremendous contributing role in the rise of individualism and groupism. While the Internet affords the expression of individual voices and identities, it also has been used to garner collective voices and identities – especially in social media spaces. The impact on leadership is huge. This is because the essence of leadership is influence on individuals towards shared goals. The task of influencing the minds, emotions, values and attitudes of followers is much tougher when the sheer diversity and complexity of it bears on leaders. In schools, leaders increasingly have to manage diverse needs of a wide range of stakeholders who now have a wider range of tools to influence decisions made in schools. Sometimes, or often, these needs are conflicting. Satisfying one group’s needs may hurt some others’. Sometimes, or increasingly often, some of these needs change over time or across situations. Brexit, Donald Trump and Hong Kong speak volume on leading divided societies. The pace of the demands placed on leaders in

schools makes the task of leading much more difficult and frustrating. The increase in diversity and complexity that leaders have to face on a day-to-day basis add a degree of certainty to uncertainty in the task of leading.

The position of leadership is therefore becoming less attractive to many laypersons, and perhaps highly attractive only for a few egotistical, idealist or foolhardy lot. *With great powers come with great responsibility* – indeed. But do all these eclipse the power of leadership? Not at all. On the contrary, leadership is integral to societies' preservation and progress. While some sociologists and organizational theorists predict chaos due to the inevitable rise of complexities in societies, some would then argue the inevitable rise of leadership to give structure, stability and sense-making to and in societies.

However, school leadership can no longer reside in one person or one group of persons in contemporary organizations – including schools. Over the last decade or so, distributed leadership has received increasing attention and popularity – not for anything except the sheer deluge of demands placed on schools coming from different sectors of society including primarily education policymakers, parents and students. However, the influence of education policymakers is highly significant as they not only represent the people whom they serve in the community, but also are the most significant contributor to school financial support and educational policy and accountability framework. The demands on schools get even steeper when the world environment is increasingly becoming disruptive due to the intertwining of various complexities that exist in all walks of life. The leadership response is even more so needed, especially in a distributed sense so as to cope with the rising demands and complexities placed on organizations. In school contexts, senior school leaders such as principals and vice-principals have traditionally delegated some of the roles and responsibilities to middle leaders (e.g., HODs). As the demands on schools increase in tandem with the rise in complexities of world systems, some of the leadership roles and responsibilities given to middle leaders have been delegated to teacher leaders in both formal and informal roles.

The rise in teacher leadership is therefore an immediate product of the rise in distributed leadership. Distributed leadership, which is a multi-dimension construct, consists of four dimensions: (1) bounded empowerment, (2) developing leadership, (3) shared decision, and (4) collective engagement (Hairon & Goh, 2015). School leaders who seek to practise distributed leadership would first and foremost be willing to relinquish decision-making powers to other staff

members in his/her organization, but within boundaries – that is, only certain decisions which can be delegated, and without abdicating or weakening any responsibility or accountability. In this sense, leaders who distribute their leadership, will still have to be in the know or share the decisions made by others whom he/she has given the authority to make decisions. School leaders who seek to practise distributed leadership would also seek to develop leadership competences of his/her team or organizational members. Finally, school leaders who seek to practise distributed leadership would also encourage and lead other staff members to collaborate with other staff members so as to gain synergistic benefits and well-being. When all these are enacted by school leaders, teacher leaders are inevitably nurtured and developed.

There are three key dimensions of teacher leadership: (1) collegial and collaborative relations, (2) teacher professional learning and development, and (3) change in teachers' classroom practice (Hairon, Goh & Chua, 2015). All these dimensions pertain to instructional leadership practices. These practices would either be passed on from middle leaders to teacher leaders, or overlap with middle leaders instructional leadership practices. It is worth noting that one primary area that teacher leaders takes on is the promoting Professional Learning Communities (PLCs), where all the three dimensions of teacher leadership practices can be enacted. While the practice of building collegial and collaborative relations among teacher colleagues looks common or understandable, it must be emphasized that strong and healthy relationships set the foundation for trust to be developed, and on which learning from one another – in a collaborative sense, can take place well. The degree of collegial and trusting relationships would therefore affect the degree of collaborative learning that takes place among teachers. Learning among teachers would thus be hampered without a strong, healthy and trusting relationship among teachers. It would therefore be wise for teacher leaders to invest in helping teachers build trusting relationships before they could go deeper into helping teachers learn from one another. Trusting relationships would also help teacher leaders to set the tone in encouraging teachers to open up their classrooms to others. The eventual outcome of teacher leadership practices is to improve classroom teaching en route to student learning – the latter is at the heart of the professional mission of every teacher and educator.

Embedded in the three teacher leadership practices is the importance of collective learning. Collective learning can be defined as learning that takes place between individuals within a pair, group, organization, society or system so as to develop shared knowledge either in the form of

practice (i.e., embodied in performance, rituals, etc), ideas (i.e., subjective knowledge evidenced only through oral means), or artifacts (i.e., products of the mind such as manuals, encyclopedia, journals, etc). The concept of collective learning can be understood as multi-dimensional, which includes the following: (1) storing knowledge, (2) sharing knowledge, (3) reflecting knowledge, (4) interrogating knowledge, (5) applying knowledge, (6) transferring knowledge, and (7) innovating knowledge. 'Storing knowledge' involves collective learning practices that store knowledge in the form of collective practices (e.g., routines, rituals), conceptual tools (e.g., learning cycles), and materials (e.g., manuals, lesson plans, etc). 'Sharing knowledge' involves collective learning practices that transmit knowledge from one individual to another which could be in the form of practices (e.g., demonstrations), conceptual tools (e.g., teaching strategies) and materials (e.g, lesson plans, shared folders). 'Reflecting knowledge' involves collective learning practices that engage individuals to think about and articulate their knowledge on practices in the past or future to others (e.g., articulating ideas and concepts pertaining to what was taught in previous lessons). 'Interrogating knowledge' involves collective learning practices that enable individuals to question and test the veracity of their assumptions and theories (e.g., inductive and deductive thinking, inquiry). 'Applying knowledge' involves learning practices that enable individuals to collectively apply the knowledge that has been collectively developed in practice. 'Transferring knowledge' involves the collective learning practices of transferring the knowledge developed in one context to another (e.g., the strategy of cooperative learning in science being applied to math curricula). 'Innovating knowledge' involves collective learning practices that enable individuals create new knowledge which are not currently absent (e.g., abduction).

Although the practice of collective learning can be said to have existed since Adam, its relevance has become increasingly salient when one considers the increasing complexities in contemporary life where there are more questions than answers, and where answers to questions no longer depend on one person or one heroic leader. In the school setting, where complexities are easily felt due to its already highly demanding and complex context, it is no wonder that Professional Learning Communities (PLCs) has been identified to be a resource or solution to how teachers can work together to solve many school demands and dilemmas – especially on matters of teaching and learning. PLCs are now perceived as having the potential to raise the capacity of teachers to craft the school curriculum that affords learning for the 21<sup>st</sup> century competences (e.g., critical thinking, creative thinking, resilience, etc). PLCs can thus impact schools' outcomes

without the need to increase more resources into schools. However, simply putting in place time and space for PLCs does not translate automatically to improvements in classroom teaching and student learning. The quality of PLCs will have significant bearing on the quality of the outcomes of PLCs. In this regard, leadership supporting PLCs must go beyond just providing school structures through indirect means (e.g., time, space, schedule, direction, monitoring structures, etc). Leadership support must penetrate into PLCs itself. Leadership for instructional improvements must trickle down to the level of where teaching and learning take place closest.

However, leaders leading teaching and learning is now seen to be done best by those who are close to the classroom. In school contexts that are increasingly become more demanding and complex, it is understandable that school principals share or shed their instructional leadership practices to others. Traditionally, this has taken place at the middle leadership level. However, the sharing or shedding of instructional leadership practices has progressively cascaded down further from middle leaders to teacher leaders. This is because middle leaders too have to take on more administrative roles and responsibilities – in part because school principals share or shed their administrative roles and responsibilities to middle leaders in order to cope with the increasing demands and complexities. Hence, more and more is demanded of teachers to take on leadership roles to lead teaching and learning either in formal or informal roles – one of which is in the context of PLCs. In a nutshell, what is being proposed here is that the rising complexities that are being felt in all spheres of social life – including schools, would inevitably demand the need for promoting PLCs in schools, along with distributed and teacher leadership practices that support it.

In the remaining section of this paper, I will share key findings from two empirical studies that support the value of distributed leadership, teacher leadership and professional learning communities, albeit within the Singapore education context. The first study is a quasi-experiment to investigate the impact of PLCs on student learning outcomes in mathematical problem-solving. It involved 3 experimental and 6 control government primary schools, and 1,389 Grade 5 students. While both groups practised PLCs, the experimental schools received weekly intervention on enhanced PLC facilitation skills for a period of 8 months. The belief is that enhancing PLCs will enhance student learning outcomes. Grade 5 students took 4 tests spread out throughout a 1-year period assessing their problem-solving ability. Each test consists of 20 items. The raw scores of each test were converted to Rasch measures through the process of

item calibration. The measures from all 4 tests were equated through the process of progressive anchoring of 8 repeated items from Test 1 to Test 2, Test 2 to Test 3, and Test 3 to Test 4. Test equating is important so as to construct a singular ruler out of all the 4 tests. At the end of the 1-year data collection period, FGDs were conducted from 22 FGDs involving school leaders (principals and vice-principals), Math HODs, and 50 Grade 5 math teachers. As a follow-up to the quasi-experiment and FGDs, HLM analysis was carried out using data from 7 out of the 9 primary school, and involving 35 Math PLCs, and 1,108 Grade 5 students. The raw scores of a range of perception variables were converted to Rasch measures through the process of item calibration. In addition to this, fieldnotes were collected from the participant observation of the PLCs from the 3 experimental schools. The HLM served to estimate the potential effects of a range of predictors on student learning outcomes, including PLC constructs.

The second study is a survey involving 28 primary schools, 58 school leaders, 93 math teachers and 1,778 Grade 5 students. HLM analysis was carried out to estimate the potential effects of a range of predictors – primarily of distributed leadership, teacher leadership, collective learning, and teaching competencies. The dependent or outcome variable is student learning growth based on 3 Grade 5 tests – measuring mathematical problem-solving skills, taken within a 1-year period. The raw scores of the 3 tests and a range of teacher perception variables were converted to Rasch measures through the process of item calibration. It is argued that teaching and leadership are two very salient within school factors that contribute to student learning outcomes. The HLM analysis is followed by a multi-level path analysis to investigate the links between distributed leadership, teacher leadership, collective learning and student learning outcomes.

### Study 1

The quasi-experiment supports the hypothesis that PLCs do have the potential impact on student learning outcomes. The results from the dependent T-tests showed that there are significant differences between Tests 1 and 4 for both experimental and control schools, and hence indicating growth of mathematical problem-solving ability of Grade 5 students in both the experimental [ $t(526)=32.380, p < 0.01$ ], and control [ $t(863)=37.709, p < 0.01$ ] schools. The result from the independent T-test indicated a significant difference in the change (i.e., the growth or difference between students' performances from Test 1 and Test 4) of student mathematical problem-solving ability of Grade 5 students between the experimental ( $M=1.347, SD=.955$ ) and

control ( $M=1.229$ ,  $SD=.958$ ) schools,  $t(1389)=2.247$ ,  $p < .05$ , with a small effect size of 0.124 (Figure 1). This finding suggests that the enhancement of PLCs, albeit via enhancements in PLC facilitation, had impacted student learning outcomes.

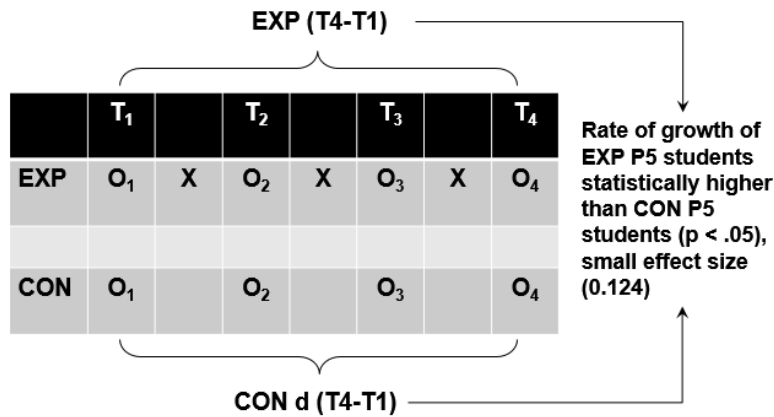


Figure 1: Dependent T-tests, Independent T-tests and Effect Size

Finding from the FGDs showed that PLCs do have a contributing role in promoting teaching and learning through collective learning and teacher leadership within PLCs (Figure 2). In addition to this, the findings from FGDs also show that leadership outside of PLCs play a role in supporting PLCs and teaching practices.

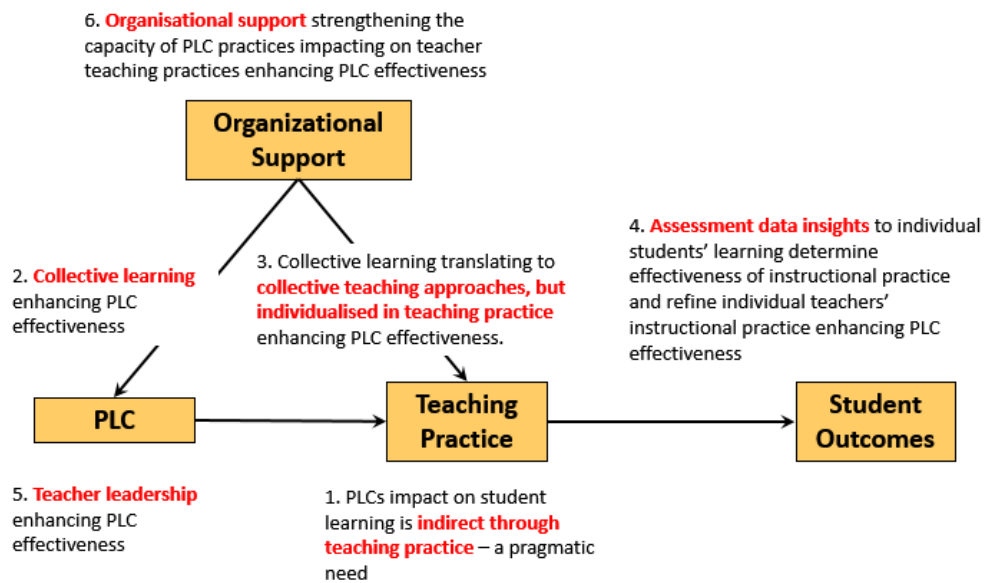


Figure 2: Themes generated from FGDs

At a more micro level, the findings from the FGDs showed that PLCs provide the space for teachers to learn collectively through the formation of collective teaching strategies, which needed to be adapted by teachers in view of the range of unique classroom contexts. It was also found that use of insights gained from data on student learning to assess and modify teaching strategies was significant to bring about positive learning outcomes. Teacher leadership has also been found to be critical to the success of PLC functioning.

The findings from the participant observation in the PLCs of the 3 experimental schools identified three possible dimensions of teacher leadership: (1) Building collegial and collaborative relations, (2) Promoting teacher learning and development, and (3) Enabling change in teachers' teaching practices (Figure 3).

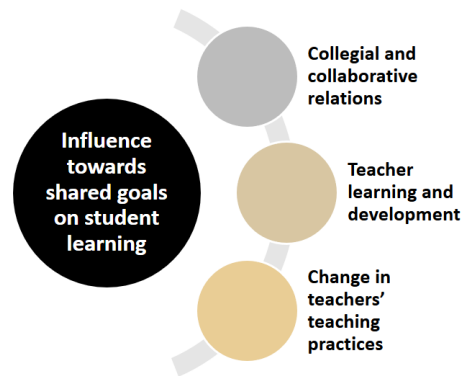


Figure 3: Multi-dimensional construct of teacher leadership

Findings from the HLM analysis identifies two PLC-related predictors to student learning outcomes: (1) teachers' attitude towards PLC, and (2) teachers' perception on PLC community (Table 1). While the former is a positive predictor, the latter is a negative predictor to student learning outcomes. The latter's negative coefficient value, however, does not mean that a strong community is a negative predictor to student learning outcomes.



Table 1: Fixed effects of HLM analysis on Grade 5 student learning growth

| <b>Fixed Effects</b>                                   | <b>B</b> | <b>SE</b> |
|--|----------|-----------|
| Intercept Level 1                                      | - 0.28*  | 0.10      |
| Teachers' Attitude towards PLC                         | 0.17*    | 0.07      |
| Teachers' perception on Assessment Knowledge           | 0.07**   | 0.02      |
| Teachers' perception on PLC Facilitator: Participation | 0.08     | 0.09      |
| Teachers' perception on PLC: Community                 | - 0.28*  | 0.10      |
| Non-government schools                                 | 0.19*    | 0.08      |
| Teachers' age group                                    | - 0.19   | 0.08      |
| Teachers' ethnicity                                    | 0.10     | 0.11      |
| Students' perception in Self-Efficacy in Mathematics   | 0.07*    | 0.03      |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

A Wright map analysis shows that the PLC community members from the sample schools was predominantly strong in collegial sharing and collaboration and lacks articulation of common goals on student learning (Figure 4). This finding suggests that a community that is strong in collegial collaborative relations but weak in articulating common goals on student learning does not have a positive contribution to student learning outcomes, and may even be counter-productive. Besides PLC-related predictors, the HLM results also showed that teachers' perception of their assessment competences does have a potential effect on student learning outcomes.

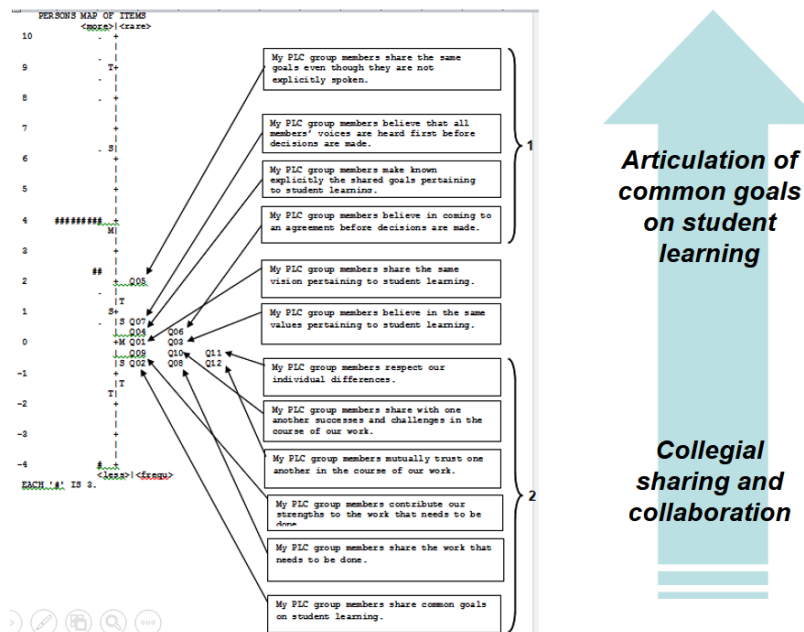


Figure 4: Wright map analysis of PLC Community

## Study 2

The HLM analysis showed several predictors on student learning outcomes (Table 2). They include 3 dimensions of distributed leadership, 2 dimensions of teacher leadership, 3 dimensions of collective learning, and 3 dimensions of teaching competencies. Wright maps for each of the significant predictors were generated especially to understand the negative predictors.

Table 2: Fixed effects of HLM analysis on Grade 5 student learning growth

|   |           |
|---|-----------|
| <b>Distributed Leadership</b>   |           |
| - <i>Bounded Empowerment</i> (More further empowering)                | - 2.170 * |
| - <i>Developing Leadership</i>  | 4.041 *** |
| - <i>Collective Engagement</i> (More synergistic collaborations)      | - 2.650 * |
| <b>Teacher Leadership</b>   |           |
| - <i>Promote Professional Learning</i> (Value it but not practice it) | - 2.738 * |
| - <i>Change in Classroom Teaching Practices</i>                       | 3.214 **  |
| <b>Collective Learning</b>  |           |
| - <i>Reflecting Knowledge</i> (Greater initiative to share practices) | - 2.777 * |
| - <i>Applying Knowledge</i>   | 2.544 *   |
| - <i>Innovating Knowledge</i> (Greater risk-taking and trust)         | - 2.319 * |
| <b>Teaching Competencies</b>  |           |
| - <i>Curriculum Content Knowledge</i>                                 | 2.192 *   |
| - <i>Pedagogical Knowledge</i>  | 2.582 *   |

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Based on the Wright map analyses, the negative coefficient for empowerment is caused by teachers' perception that a greater measure of empowerment is still lacking. The negative coefficient for collective engagement is caused by teachers' perception that the leadership given to collective engagement among teachers was not synergistic. The negative coefficient for teacher leadership in promoting professional learning is caused by the lack of teacher leaders' actual performance or actual demonstration of it. The negative coefficient for reflective knowledge is caused by teachers' lack of self-directedness or initiative in leading others to bring into their learning discussions each others' teaching practices. The negative coefficient for innovating knowledge is caused by teachers' lack of trust and risk-taking when they are in the context of generating new ideas on teaching and learning.

Finally, the multi-level path analysis shows that empowerment has a positive effect on teacher leaders' practice of enabling change in teacher's teaching practices. The latter then has a positive

effect on teachers' collective learning of 'reflecting knowledge' where they bring into their learning conversations their classroom teaching practices. The collective learning of 'reflecting knowledge' is then translated to 'applying knowledge' where the learning generated from discussions about classroom teaching practices are considered for transfer to classroom teaching practices. This would finally have a positive effect on student learning outcomes. Refer to Figure 5.

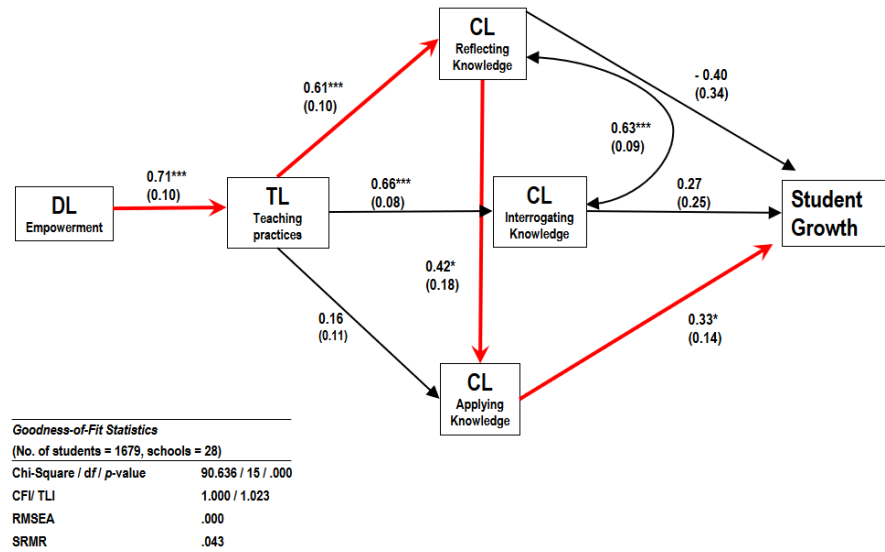


Figure 5: Multi-level path analysis

The key findings from the two studies do provide strong evidences to corroborate the proposition on the importance distributing leadership across the school organization, and that teacher leadership is the direct outcome of distributed leadership. It also supports the proposition that teacher leadership practices tend to lead to teachers' effort in coming together to synergize their knowledge on teaching so as to support student learning. The learning within contexts of collective learning such as PLCs would however depend on teacher leaders who focus and invest in improving classroom teaching, and through the process of bringing classroom experiences into PLCs, and bring PLCs to classroom experiences. Effective collective learning would also involve the use of data to assess effectiveness of teaching strategies and modifying it appropriately – sensitive to the unique context of classroom teaching which takes into consideration the inter-play between teacher and student characteristics. In doing all these, the teaching competences especially on curriculum, pedagogy and assessment are developed. The

findings from the two studies also strongly suggest the importance of developing leader competences in teachers across the school organization. In conclusion, the development of teacher leadership seems to be promising in terms of the building up of teacher competences, and in view of the growing complexities of the current times. This has tremendous bearing on how teacher educators develop pre-service and in-service teachers. No longer can teachers aspire to be lone teachers within the compounds of their own classroom students. Teachers are now compelled to work with other teachers and lead other teachers to develop their social capital so as to provide a strong and relevant response to the new demands placed to teach in ways that support 21<sup>st</sup> century learning competencies - within a growing complex world.

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