

Chapter 8

Fostering School-wide Knowledge Building Practice: Leadership by the Middle Managers



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Abstract To deepen and sustain an innovative practice in a school, each layer of players within the organization—students, teachers, teacher-leads, head of department, school leaders, play different roles in contributing and advancing the vision and practice of the innovation. Not only that, the way these ‘mid-layer leadership’ interacts to create a coherent force in moving the innovation culture is critical. In this study, we look particularly at the role of middle managers in deepening and sustaining a twenty-first century teaching and learning practice and knowledge building within the ecosystem of the whole school. We look at this practice as it did not particularly receive top-down or bottom-up support at the on-set of the project in the case studies below. The decision to embrace and experiment with the practice was taken by the middle manager and much of the navigation, strategizing and advancing within the organization relied on these middle managers as well. In this chapter, we analyse the work of three middle managers to understand the realities of leading from the middle through identifying key dimensions, strategies and approaches adopted as well as the tensions they experienced as ‘mid-layer leaders’ in sustaining knowledge building practice and culture in their school.

8.1 Introduction

“Leadership from the Middle” is defined as an adaptation of strategies that increases the ‘capacity and internal coherence’ of the middle layer within an organization with the goal of achieving better performance (Fullan, 2015a, 2015b). Leaders in the middle, their advantage and work are characterized by their deep understanding of the local community and context. Ironically, their challenges are also entrenched within the familiarity of the community and context. This means that most of the time they have to rely on collaboration instead of leadership position; they also have to enact through a network of professional and personal relationships more than that of authority.

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D. Hung et al. (eds.), *Diversifying Schools*, Education in the Asia-Pacific Region: Issues, Concerns and Prospects 61,
https://doi.org/10.1007/978-981-16-6034-4_8

Such leadership is particularly important in advancing more innovative teaching and learning collaborative practices for the twenty-first century which requires a coordinated shift of different areas of teaching and learning, e.g. curriculum, pedagogy, assessment, bought in by different stakeholders in the school. This middle leadership within a school is deemed to be ideal in forging an effective partnership upward towards more senior management within the organization to gain support and downwards to a team or a community to sustain practice. The goal of this 'middle leadership' is to connect leadership to school improvement, strengthening the coherence within the organization in relation to goals and needs through community building. The middle is supposed to mobilize and develop pervasive capacity, while at the same time, the middle works within its schools more effectively and becomes a better and more influential partner upwards and downwards to the centre.

The case studies are derived from a knowledge building project. We traced the role played by middle managers in schools with the knowledge building innovation in their school. In tracing the work of this middle leadership, we attempt to explain what is at the heart of every level of effective school's 'middle' by identifying their roles, strategies and approaches, especially in the building of professional learning community to sustain innovation. We also triangulated the challenges and tensions they experienced as 'mid-layer leaders' in sustaining and scaling knowledge building practice in their school.

8.1.1 Background

The innovative practice that forms the basis of this study is the knowledge building practice. Knowledge building theories, pedagogy and technology define a focus on the generation and continual improvement of collective ideas in a community. When translated into a classroom, knowledge building practice signifies an effort to place students' ideas at the centre of teaching and learning activities (Scardamalia & Bereiter, 2006). Knowledge building pushes the modus operandi of classrooms into a knowledge creation paradigm where the teaching and learning culture requires one that is full of research, development, generation and shaping of new practice by teachers (Kozma, 2008). In Table 8.1, we defined the possible of continuum in terms of curriculum, pedagogy and assessment in relation to the three paradigm with the aim of helping us understand the role of these mid-layer leaders in navigating the school landscape to bring about knowledge building culture.

Knowledge building practice focuses on making students' questions, ideas and learning explicit and allowing teachers to bring these ideas and questions to the centre of the classroom work. Teachers and students then engaged in a series of knowledge building process such as formulating questions and investigation, researching, summarizing and synthesizing to forge deep learning. As students constantly work in an environment rich in real and authentic ideas, they develop a community mindset to constant check their ideas against peers and authoritative sources, as well as constantly figuring out ways to develop and improve their explanation to problems.

Table 8.1 Possible continuum of alignment across curriculum, pedagogy and assessment required based on the three paradigm of knowledge acquisition to knowledge deepening to knowledge creation paradigm (Kozima, 2008)

	Knowledge acquisition paradigm	Knowledge deepening paradigm	Knowledge creation paradigm
School process and structures	Process and structure focuses on increasing ICT skills, and school-based and national exams results, mainly on building strong numeracy and language literacy	Process and structure focuses on improving the understanding and problem solving skills of students and connecting their learning to real-world problem and contexts	Process and structure focuses on research, development, generation and shaping of new practice knowledge

(continued)

Table 8.1 (continued)

	Knowledge acquisition paradigm	Knowledge deepening paradigm	Knowledge creation paradigm
School alignment across curriculum, pedagogy and assessment	<ul style="list-style-type: none"> The curriculum (commonly known as scheme of work (SOW)) defined in each subject emphasizes on facts and concepts within each subject that is to be acquired by students Teaching is mainly on delivery of content defined in SOW. Didactic teaching and teacher-centric learning activities are more common though information may be presented in an interesting manner Instructions/pedagogy are usually of the one-size-fits-all sort that targets at whole class having similar experience and learning, meaning it has to work for everyone in a class of 40. There is usually an emphasis on orderliness and standardization School-based assessments are composed of traditional pen and paper mode. Mainly comprise of factual recall and the application of knowledge to solve simple and familiar (versus complex) problems Accuracy and linearity (e.g. vary one thing at a time) is emphasized Students are tested frequently and receive regular feedback on progress 	<ul style="list-style-type: none"> The curriculum/SOW identifies themes based on concepts that organize the subject area. It emphasizes understanding of these within and across subjects and their application to solve complex real-world problems Curriculum/SOW defines both the soft skills and process skills to be developed in students, but content goals is foregrounded Approach to implementing curriculum attempts to respond to contemporary and local contexts but the balance is tilted towards completion of SOW Introduction of open-ended questions and problems that anchored in real-world contexts in teaching, but with limited complexity Classroom activities involve the application of key concepts to solve problems Attempt to create synergy across subjects Assessments (Class tests or quiz) may composed of a few extended, open-ended questions. It may include multipart problem-based projects that contributes to year-end results. However, system will still rely on summative assessment Project-based projects embed concepts that correspond to real-world situations and tasks are integrated into the learning experience 	<ul style="list-style-type: none"> The curriculum/SOW has themes that define concepts and principles of the subject area. However, the curriculum is deemed to be responsive to student goals and learning It emphasizes on the development of soft skills and process skills as much, if not more than the content goals Approach to teaching includes enculturating students to build on their knowledge and explore new topics framed by principles defined in curriculum Collaborative projects and investigations involve searching for information, collecting and analysing data, generating knowledge products, is the norm Assessment tasks consist of investigations, reports, presentations, creative works and other knowledge products Project products are evaluated through self, peer, and public review, as well as expert review. Assessments also emphasizes student goal setting and self-monitoring

Such KB classroom develops in students: resilience, collaboration, communication, creativity and critical thinking, which are mostly explained with a suite of analytics. There are currently some 15 schools in this project working to implement and disseminate these ideas-centred approach to teaching and learning. The description below defines broadly the conditions to keep KB practice alive in school and the need for us to understand the concept of leadership from the middle in such context and background:

- School-led transformative practice: Though the idea-centric practice are compatible with the grand vision of future learners and teachers as designers as defined in the ICT masterplan policy, but KB practice are mainly initiated by schools and not by the ministry that focuses on equal implementation path for all. The schools are taking up the initiatives in their own right and in teaming up with researchers, other schools and international network.
- Deepening and Sustaining: The essence of knowledge building work requires both of continual innovation and spread so that new ideas and new knowledge continue to energy the work of the community. Many schools are interest in pedagogies that engage students and teachers in real-life problems and develop twenty-first century competencies but struggled in defining new educational term as such ‘design capability’ and in balancing between what needs to be ‘tightly monitored’ and what needs to be ‘loosely scaffolded’, and finally, what needs to be ‘let go of’, especially in the area of curriculum, pedagogy and assessment (Fullan et al., 2014).
- Ecological coherence: An innovative practice like knowledge building requires a constant (re)alignment of visions and directions from within the micro- (classroom), macro- (school) and meso- (system) (Toh et al., 2014). In realities, such the alignment has always to be bootstrap within micro- and macro- and at its very best supported by a broad direction provided by the policies so that innovative practice could take root.

8.2 Method

This qualitative study aims to understand the role of the middle managers in leading an innovative project, knowledge building practice, within a school ecosystem. We focused on what these middle managers actually do to effectively lead the innovation from the middle. The leadership from the middle in this particular innovation is particular interesting because it fits the description of an effect that is recognized by the school leaders or the system, nor has it been well received by teachers. Participants included the head of departments and lead teachers from four schools in the knowledge building projects. Data were collected using semi-structured interviews and were analysed by coding. The interviews touched on the middle managers’ roles, strategies and approaches in the following areas process/structure; curriculum-pedagogical-assessment alignment, PD and resource design (Table 8.1).

8.3 Literature

The concept of leadership from the middle challenges the notion of traditional leadership model that relies on the idea of one or few great man having exceptional traits and characters to lead; or emphasizes the idea of leadership behaviour; (iii) emphases on the situatedness of the leadership (Shamir et al., 1993). Leadership from the middle moves away from leading by authority and position, though it will never really deviate from these two component of leadership. Middle leaders understand the environment and people; they focus their leadership through collaboration and enact their leadership through building communities of professional and developing personal and professional relationships (Fullan, 2015a, 2015b).

One of the key strategies to be adopted by middle leaders is the development of professional learning communities for successful school reform (DuFour, 2007; Huffman & Hipp, 2001; Zhang et al., 2011). This strategy works in both ways: first, professional learning communities created greater leverage for capacity building towards transformational leadership where people are continually learning how to learn together". Studies provide consistent results that teachers who are feel supported as a community in their classroom practice were more committed and effective (Little, 1993; Rosenholtz, 1989). Second, in a symmetrical way, teachers who functioned as learning communities have shown a greater ability to foster similar collaborative learning in student that leads to better learning.

8.4 Analysis

The three middle managers featured in this study is on similar trajectory in their leadership journey of KB in the following ways:

- (i) All three middle managers were involved in the project >5 years. All of them are from our first two schools who seeded the work of the KB network back in 2010.
- (ii) All three middle managers have been involved as principal investigator or co-principal investigator in major funded knowledge building research project. They all have been serving as the project leads in their respective school and in these schools, the KB practice has been integrated fully in at least one department.

We studied their reflections and interviews and identified for a collection of repeated instances from the data in relation to the areas of (i) process/structure; (ii) alignment of curriculum; (iii) alignment of pedagogy; (iv) alignment of assessment; (v) professional development and resource, paying special attention to those that provide insights to the concept of middle leadership in innovative practice in managing conflicting culture, dynamics and tension. We then try to look for connections between two or more sets of codes to establish pattern and generalization.

8.5 Findings

In this segment, we coded these middle managers' experience and perspective in unpacking the role they play in the areas of (i) process/structure; (ii) alignment of curriculum; (iii) alignment of pedagogy; (iv) alignment of assessment; (v) professional development and resource; (vi) technology.

8.5.1 *Professional Development: Redefining Goals and Purpose of Professional Learning Community*

The interview shows that these middle managers are constantly caught in the midst of conflicting cultures, pressures and priorities among the different demands in school, continued to forge ahead to position themselves as the possible influence in the areas listed in Table 8.1. These middle managers are able to maintain focus on they could control over what they have little influence and turn constrained by tensions inherent in the role and in the system and increasingly accountable for outcomes into opportunities for KB work. In this study, these middle managers are constantly defining process/structure and meaning of their K_b project work quite differently from the other teams in the school.

For the Science team, we used to be here (teacher pointing to the middle part of paradigm 2 in curriculum alignment) as of 2015 -we are very much here but we have not really talked about it, like connecting to real world. But I think for the past 2 years effort is put in by the team, for the science dept.

For the KB plc (professional learning community) - ours is a lot more than just connecting ideas n real world problem, we do that as well, so this is encompasses this...if I am doing this, I am definitely doing this (pointing to paradigm 2 and paradigm 3). For KB practice, over the years we have very gradually, very gradually, progressed. We have come to a state that we no longer fear, we are able to make changes quickly we are not afraid to try. The KB, the PLC has given a chance for me to tell the teachers that we try it first. We see how it goes then we go on. I would say that flexibility is there. for school. We would say we are here.

Last time they used to be afraid to even attempt, the fear of what if we cannot do this, what if it affects the students results. It is very much orientated towards exams, but what the top management has done to bring teachers together, de-emphasise on exams. shifting the mindset, to move away from constantly looking at the numbers has helped bridged...

8.5.2 *Bridging Pedagogy That Centered on Students: Whats Now, What's Not and What's Possible*

These middle managers, though remained apprehensive of the challenge and obstacle in bringing knowledge building to their teachers, showed unwavering commitment to improving students' quality learning. The following is one of the middle managers'

reflections on how KB pedagogy is necessary for her normal technical students (the least academically inclined students in school). Their goal remained fixated on promoting innovation and ensuring that ICT supports and enhances students' learning. Their measurement of shift usually revolved around 21CC, for example 'we might measure the way students begin to be more curious and asking more question. They are not afraid to let their ideas be heard. They are also eager to hear their peers' ideas'. The following snippets of interview shows how the middle manager reflected on what they see as a successful in their own class and in their teacher team.

.... I have all the resources. I have all my resources there. Touch of a button I've got power-point, worksheet, everything. I'll deliver a good lesson. My children will have outcome when I look at their worksheet, if I look at their assessment I'll know how much I've done and I'll analyze it and I can make them do amendments and ensure it's all done. But I think ... I can't do, I almost think it's a static lesson. I want something more dynamic for my children. A little bit (more), wherever possible I want them to do a little bit more of thinking for learning. I think that's the onus on me, for later on even when they go to the poly or JC. I think this is important.

When they (teachers) go in with authentic problems/ ideas/ issues to discuss with students. Allowing students space to share their ideas. Critique/ challenge each others ideas and collaboratively synthesise knowledge together with the students.

One distinct pattern that emerged in this group of middle managers is the need for them to constantly reflect and review on what is 'not KB' in order to advance the kb pedagogy in their school.

This is my new challenge... I am kinda the reminder to tell them this is KB and this is not KB - try not to do this, we should think of the task given, how does this make the child a critical thinker. That kind of question raised in the meeting - it is very good, it makes the whole team think about how to make changes in terms of the changes in the ALP.

Challenges are two forms, one is within a team, there are different definition of KB, it is not about right or wrong, we know we have different way of thinking about it, so do I come in to facilitate and change the KB style to be my form or do I let them... when should I come in. and sometime when they think different way, might not be KB, example. like guided inquiry, is that a KB? maybe? maybe not.

8.5.3 Assessment: Measuring Success in a Meaningful Way

These middle managers continuously seek and use evidence to inform change and develop practices with the aim to improve students' outcomes. They engaged long hours of conversation with researchers to understand outcome and to formulate ways to improve the implementation. They would also almost for sure set up their own data collection mechanism to understand impact of KB on their students. However, above all these, all the middle managers in this study articulated what the students' shift meant to them with or without quantitative results from examination.

When I asked my students to rate their learning experience using KF. Many gave the positives. They liked the idea of being able to read their friends inputs, discover new thoughts and built

upon ideas. That in itself created the dynamism and synergistic learning. I also noticed a certain level of maturity in my students' acceptance of ideas as they progressed on in their KF lessons. Their willingness to work on ideas as a collective rather than as individuals and in working out new ways of thinking. That's success to me.

For students...there maybe different stages, success, they know the subject much better, for now. or...they started to see the value of coming together. No longer just I (referring to students) know, I have to do group work. Now is, maybe they are not enjoying yet, but I(referring to students) see the value of doing group work, not that you do one I do one. they do together, or maybe they might be doing one part each but let's think of ways to help each other, to fine-tune.

On measurement? For qualitative there is no issue, we can always use interview and reflection. For quantitative, we use the analytical tool to show tightness of their ideas and another one is for them to trace their input. For school-based results? I heard from HOD, to them they love KB but our exam doesn't cater to that.

Interviewer asked: "So do you then see a need to actually trace students' results to see what the benefit these approach has on students?"

In terms of results, it is easier to reach out to people, no matter how dynamic we are, the national exam is very confined. I see the need for students to be confident about their learning. of course from management perspective, they want to see translation of results.

8.5.4 Redesigning Curriculum

Most middle managers are more conservative in this area. All of them marked the curriculum work in KB and in their school within the knowledge deepening paradigm.

When teachers have the curriculum map at their fingertips and they are comfortable and competent to navigate students' ideas, discussions and collaboration under the umbrella of the syllabus and still meeting the assessment requirements.

Using KB Principle to map the trajectory of KB work: We saw a consistent reference to knowledge building principles across all case studies. Such principle-based approach means that the middle managers might be more focused on core values and principles of the actions and they are most likely to be able to leave teachers the challenge of interpreting and adapting classroom and pedagogical decisions to accommodate their different contexts and possibilities. Teachers are expected to continually improve procedures derived from principles, leaving the teachers to explore further through discussion and peer review in the professional learning team.

I want to challenge them to not just talk about the two principals, they are always talking about idea diversity and improvable ideas. We are so comfortable with this, we are a kind of mature school - it is time to do something more or something better, this time round we must start to look at quality of ideas, see how we can challenge the children to think deeper and get them to use the promising tool how will this translate into their characters. I understand we may not achieve all 12 but I certainly believe we can go beyond three that is my gut strong feeling - maybe we do touch other principles, is it strong enough for them to feel that they are doing this. If you ask them, they will say, yes, I am doing this, yes I am doing this. But the other principles, it is more like a touch and go.

We are more principle based, we have procedure but procedures can swap. To me KB, you must be flexible but professional enough.

8.5.4.1 Strategies and Approaches

(i) **Modelling KB practice, tackling the toughest challenge**

These middle managers used modelling of the pedagogical practice as way to address resistance to change. A common characteristic we found in these middle managers is their interest and focus in knowledge building classroom. They willingly took on the challenge to design and implement knowledge building lessons in their class and even took on the challenge to work with the tougher class, i.e. academically weaker classes. The mentor their teachers by partnering them in class, took time to systematically study and analyse students' notes with their teachers. In doing so, they ensure that their teachers understand their role in implementing knowledge building practice. Based on their personal understanding of KB, they then navigate the way to explain the practice to their senior management and to their peers.

(ii) **Constantly reviewing and adapting connected strategies to realize school's vision and capacity for change**

Successful middle managers understand how change processes work in their school and how people within the school respond to changes. With this knowledge, they then put in place planning and resourcing including mentoring structures, professional learning conversation, defining Syllabus Instructional Objectives, research partnership. One of the most important move by successful middle managers is to align knowledge building to existing school initiatives.

We've had a school-based initiatives on "assessment for learning" and on "communication". This is a school wide practice so I have to get teachers to see that they are working on KB and also working on these initiatives. I am very much guided by the need to include everybody in identifying their own practice with KB. They need to know they are already doing it then work on it more... Teacher need to monitor and evaluate students' progress to identify AFIs in learning. Students can also be train to chart and track their own progress (Self-monitoring) to identify their AFIs in learning.

(iii) **Building relationship, getting buy-in is more important than getting things to happen**

These middle managers constantly bring in their knowledge of their teachers' current belief and practice to help the teachers engage with knowledge building ways of teaching and working. These middle managers usually emphasized on building relationships based on trust, and their priority is to make the teachers feel supported and understood. They are never in a rush to introduce just another 'innovative pedagogy'.

It is important for my department teachers to work and collaborate with one another to share ideas and build ideas to have a good KB lesson. I want the teachers to also be a community of knowledge builders as well to sharpen our competencies.

8.6 Discussion

Leading change is complex and involves a number of stages (Fullan et al., 2005). Analyses of middle managers' response indicated that they are constantly engaged in extended discussions related to knowledge building practice throughout the implementation. We saw these middle managers' KB work aligned closely with schools' vision and in three ways that is very much aligned to the concept of leadership from the middle. Two of which are more familiar and in line with the literature on leadership from the middle, they finally seemed to have emerged as an important overlap between such leadership and that of knowledge building community.

- **Culture building:** First, they see their kb work situated in the school to build a certain culture of response to failure, test and trial and of working together. They identified problems in the implementation phases that needed attention; they would generate possible solutions, revisit issues they have faced at different points in time and show a genuine interest in the work of their students and teachers. One of the key things they do is to constantly revisit the relevance of Knowledge Building in education and learning and in relation to their whole-school approach.
- **Community building:** Second, their model of kb PLC across all case studies showed that to be a potential way to influence the other PLC in the school, to focus on systematically understanding students learning through the artefacts collected in school. A great deal of their work is negotiated within a community model, celebrating small success with their department teachers; these are also consistent in their meetings with teachers (which are not included as data in this study. Finally, middle managers' involvement reveals many connections between community and individual work that serve to deepen and sustain the practice within the school. They are always creating opportunities and structures for teacher to help to influence and develop other teachers.
- **Continuity as an organizational principle:** Rooted in the knowledge building principles, the notion of innovative continuity initiated by these middle managers reflects a strong spirit of 'ownership' to design the dimensions including curriculum, pedagogy and assessment, PD. The coordinated effort in these dimensions seemed to form the basis for their leadership. This principle-based continuity (refer to Table 8.1) provides directions to forge two interrelated areas: (i) the horizontal spread that link learning and teaching experiences between and across teachers and students; (ii) vertical deepening and growth that enhances evidence-based practice by linking advances in research to classroom practice. This continuity built on a strong set of principles establishes the opportunities for increased meaningful connections between teachers and students. It is not just about relationship building nor is it about foreground students' voice in a flux where we get into the post-modernistic entanglement. It is about integrating important educational themes across topics, levels or even across disciplines, across initiatives (continuum of curriculum). It is about focusing on the developmentally appropriate attainment and assessment of students competencies (continuum of assessment) and promoting the connection between research and practice ('continuum

of alignment of curriculum, pedagogy and assessment’); and finally, it is about enhancing leadership, role modelling and mentoring (‘continuum of PD’) (Table 8.1).

References

- DuFour, R. (2007). Professional learning communities: A Bandwagon, an idea worth considering, or our best hope for high levels of learning? *Middle School Journal*, 39(1), 4–8.
- Fullan, M. (2015a). Leadership from the middle: A system strategy. *Education Canada*, (4), 22.
- Fullan, M. (2015b). Leadership from the middle. *Education Canada*, 55(4).
- Fullan, M., Cuttress, C., & Kilcher, A. (2005). Eight forces for leaders of change. *Journal of Staff Development*, 26(4), 54.
- Fullan, M., Langworthy, M., & Barber, M. (2014). A rich seam. In *How new pedagogies find deep learning*. Online: <http://npdl.thumbtack.co.nz/wpcontent/uploads/2015/08/A-Rich-Seam.pdf>
- Huffman, J. B., & Hipp, K. A. (2001). Creating communities of learners: The interaction of shared leadership, shared vision, and supportive conditions. *International Journal of Educational Reform*, 10(3), 272–281.
- Kozma, R. B. (2008). Comparative analysis of policies for ICT in education. In *International handbook of information technology in primary and secondary education* (pp. 1083–1096). Springer US.
- Little, J. (1993). Teachers’ professional development in a climate of educational reform. *Educational Evaluation and Policy Analysis*, 15(2), 129–151. Retrieved from <http://www.jstor.org/stable/1164418>
- Rosenholtz, S. J. (1989). Workplace conditions that affect teacher quality and commitment: Implications for teacher induction programs. *The Elementary School Journal*, 89(4), 421–439.
- Scardamalia, M., & Bereiter, (2006). Knowledge building: Theory, pedagogy, and technology. *Cambridge handbook of the learning science*.
- Shamir, B., House, R., & Arthur, M. (1993). The motivational effects of charismatic leadership: A self-concept based theory. *Organization Science*, 4(4), 577–594. Retrieved from <http://www.jstor.org/stable/2635081>
- Toh, Y., Jamaludin, A., Hung, W., & Chua, P. (2014). Ecological leadership: Going beyond system leadership for diffusing school-based innovations in the crucible of change for 21st century learning. *Asia-Pacific Education Researcher*, 23(4), 835–850 (Springer Science & Business Media B.V.). <https://doi.org/10.1007/s40299-014-0211-4>
- Zhang, J., Hong, H., Scardamalia, M., Teo, C. L., & Morley, E. A. (2011). Sustaining knowledge building as a principle-based innovation at an elementary school. *Journal of the Learning Sciences*, 20(2), 262–263.