Chapter 11
Leadership Supporting Innovation in Curriculum: Essential Lessons

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Abstract The task of school leadership has never been less challenging than before especially taking into consideration current education reforms that demand extensive, comprehensive and in-depth changes. At the ground level, schools as organizations are now engulfed in this sea of change characterized by increasing rapidity, intensity, fluidity, complexity and uncertainty. School leaders, being the sole authoritative figure, are faced with increasing demands from a range of stakeholders inside and outside schools including policymakers, district authorities, business partners, parents, teachers and students. A main upshot of which is school leaders' responsibility and prerogative to provide diverse curricula that satisfy diverse needs of stakeholders. This chapter describes findings from a qualitative study of one government primary school in Singapore which had undertaken a school-based and school-wide curriculum innovation involving ICT. The study brings to the fore the indispensable role of leadership across all levels of the organization encompassing a diverse set of leadership models to support curriculum development and innovation.

Keywords School leadership · Curriculum innovation · School-based curriculum development

11.1 Introduction

The inception of the 'Thinking Schools, Learning Nation' (TSLN) policy initiative in 1997 was a precursor to a myriad of rapid, wide-ranging, deep-changing education reforms in Singapore. This was predominantly motivated by globalization forces in economic and social facets. This policy initiative received a further boost with the introduction of another major policy initiative coined as 'Teach Less,

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Learn More' (TSLM) in 2005, which saw further comprehensive reforms in education. By 2013, the education ministry further casts their attention to values education. The policy reforms that took place since 1997 essentially require key education stakeholders to consider school outcomes beyond academic achievements (e.g., twenty-first century competencies) due to the changing economic, social and political contexts surrounding education. The apparent upshot to these reforms is the increase and complexity of demands placed on schooling. Educational contexts are increasingly getting complex insofar as the changes accompanying educational reforms are characterized by intensity, rapidity, fluidity, uncertainty and complexity.

Schools are therefore expected to satisfy needs of multiple stakeholders, namely policymakers, parents and community members—needs that are increasingly getting more demanding and complex. Also, school leaders and teachers are to provide appropriate educational curricula that satisfy these needs. However, the real challenge is on school leaders to mobilize and optimize physical and human resources toward shared organizational goals in increasingly complex educational contexts. One reason for this rising complexity is due to the general weakening of classifications in social relationships and boundaries and a moving away from organized social structure to network culture (Hartley, 2007). A former example is the general rise in parental expectation and intrusion into teachers' professional practice. A latter example is the general rise in partnerships between schools and external organizations. Furthermore, contemporary reforms in the public service have been observed to demand greater 'joined-up' or 'network' regime of governance—a societal culture wherein (i) all categories and classifications are weakened and rendered increasingly permeable (a flexible 'liquid modern' view of space and time) and (ii) the new work order consistent with the knowledge economy (where individuals work and learn beyond bureaucratic enclosures using their loose spatial and temporal codes) (Hartley, 2007).

It is therefore understandable that contemporary school leaders have to use more time and energy in managing these increasingly fluid and cross-boundary relationships. It is also not surprising that school leaders resort to distributed leadership, where decisions are delegated and shared to other staff members beyond the purview of school principals. In the Singapore context, delegation or sharing of leadership decisions to middle managers such as department heads (HODs) or subject heads (SHs) has been a common place for at least more than two decades, especially that pertaining to instruction. In this sense, distributed leadership is closely tied to instructional leadership insofar as the former allows instructional leadership practices to be delegated or shared to other staff members beyond school principals or vice-principals. Unsurprisingly, the link between instructional leadership and distributed leadership has been observed before (Lieberman & Miller, 2011; Spillane & Louis, 2002; Timperley, 2005). In this respect, instructional leadership practices have become more dispersed across the school organization, making it more effective to bring about enhancements in teaching and learning.

However, over the last decade, leadership decisions pertaining to instruction have been delegated and shared to teachers who are considered informal leaders, or teacher leaders, in response to growing intensity, rapidity, fluidity and uncertainty in education reforms. This is a result of the growing demands placed on schools so much

so that administrative decisions have to be passed on from senior to middle leaders, which result to middle leaders delegating or sharing their decisions on instructional matters to teacher leaders. These teacher leaders include Senior or Lead Teachers (STs and LTs), Subject and Level Reps and Professional Learning Community Team Leaders—all of which are involved in making leadership decisions on instruction. The effectiveness of distributed leadership to enhance instruction is therefore dependent on how well instructional leadership is distributed to teacher leadership, and thus how well both distributed leadership and teacher leadership competencies are developed. However, while delegating or sharing decisions on instruction from senior to middle leaders has been formally established for some time, the distribution of instructional leadership from middle leaders to teacher leaders is not. Furthermore, distributed leadership is not merely to do with delegating, relinquishing or sharing decisions on instruction from senior to middle leaders or from senior and middle leaders to teacher leaders. It involves empowering staff in decision making, developing leadership, encouraging shared decisions and providing collective engagement (Hairon & Goh, 2015).

Although the problems raised above describe realities at the ground level and pose tremendous challenges to school leaders, what is most pressing and demanding is school leaders' task in leading curriculum development and supporting curriculum innovations in present-day education contexts. How do school leaders lead organizations to initiate, develop and sustain curriculum innovations? What strategies do they use to develop appropriate school curricula? What leadership practices support curriculum development and innovation? How are leadership practices distributed across the organization, and to what effect? Who are the instructional leaders within school organizations? This chapter describes research findings from a qualitative study of one government primary school in Singapore which had undertaken a school-based and school-wide curriculum innovation involving ICT. The purpose of the study was to investigate how school leadership supports curriculum development for curricular innovation involving ICT.

11.2 School Leadership Matters for Curriculum Innovation

The question whether leadership makes a difference to the success of schools, or any organization or institution outside education, is not of contention in contemporary thought. For centuries—as demonstrated in the writings of Plato, Caesar and Plutarch (Bass, 1981), it has been assumed that leadership is critical to the success of any human endeavor (Marzano et al., 2005). Nevertheless, what is of interest now is primarily to do with—(1) the extent of effect leadership has on school improvement processes and outcomes, (2) how leadership affect school improvement processes and outcomes, (3) how contextual factors within and outside schools affect the extent and ways in which leadership has on school improvement processes and outcomes, (4) how leaders' individual differences affect the extent and ways in which leadership has on school improvement processes and outcomes and (5) the ways in which

leadership are developed to optimize the ways in which school leadership affects school improvement processes and outcomes.

Although interest in leadership started as early as the first half of the 1900s—specifically trait theories in the 1930s, interest in leadership in schools only had its strong impetus in the 1980s along with the burgeoning of the school effectiveness movement. And although leadership is centrally to do with influence—defined as 'a social influence process whereby intentional influence is exerted by one person [or group] over other people [or groups] to structure the activities and relationships in a group' (Yukl, 1994, p. 3) or simply a process of influence in achieving shared goals (Bush & Glover, 2003), the study of leadership in education has shifted its focus on leadership practices. This is in part because influence as a construct for investigation is both methodologically difficult and too simplistic to investigate. The focus on practices is also contemporaneous with the shift from trait theory of leadership to situational and behavioral theories of leadership especially with Stogdill's (1948) findings which severely challenged the utility of trait theories on leadership. In many ways, the focus on leadership practices, or behaviors, in education mirrors or follows that in the field of organizational study. Since its great impetus in the 1980s, the concept on educational leadership has grown in complexity. In their review on educational leadership from 1988 to 1995, Leithwood and Duke (1999) found 121 out of 716 articles that pertain to leadership. In their review of leadership research over ten years, Heck and Hallinger (1999) observed a clear trend toward the accumulation of knowledge on school leadership and postulated the continual expansion of interest in leadership research along with its eclectic diversity—philosophically and methodologically speaking, in view of leading and managing effective schools in an era of educational reforms.

By early twenty-first century, knowledge on school leadership has reached a point where there is a general consensus that not only school matters, but also how school leadership matters. In this regard, Leithwood et al. (2006) outlined seven 'strong claims' about successful school leadership:

1. School leadership is second only to classroom teaching as an influence on pupil learning.
2. Almost all successful leaders draw on the same repertoire of basic leadership practices.
3. The ways in which leaders apply these basic leadership practices—not the practices themselves—demonstrate responsiveness to, rather than dictation by, the contexts in which they work.
4. School leaders improve teaching and learning indirectly and most powerfully through their influence on staff motivation, commitment and working conditions.
5. School leadership has a greater influence on schools and students when it is widely distributed.
6. Some patterns of distribution are more effective than others.
7. A small handful of personal traits explains a high proportion of the variation in leadership effectiveness.

Table 11.1 School leadership models

Type of leadership	Orientation
Instructional leadership	Curriculum and instruction
Extended instructional leadership	School mission
	Managing the curriculum
	Providing learning climate
Transformational leadership	Models organizational values
	Develops shared mission
	Provides intellectual stimulation
	Builds consensus
	Redesigns organizational structure
Integrated leadership	Conditions supporting school improvement
	Instructional leadership; broader perspectives on organizational effectiveness, leadership roles 'delegated' to people and structural coordination mechanism

Although knowledge on school leadership has indeed become more diverse and eclectic over more than two decades, it has also become more integrated (Hendricks & Scheerens, 2013) insofar as we are now able to identify specific practices that are considered effective in school leadership drawn from the wide array of leadership models, especially instructional or curricular, transformational and distributed leadership. As an illustration, Hendricks and Scheerens (2013) provided a schematic view of the development in the concept formation on school leadership in Table 11.1.

Leithwood et al. (2006) had also proposed a form of integration by proposing four categories of practices that are considered successful leadership practices: building vision and setting direction, understanding and developing people, redesigning the organization and managing the teaching and learning programme. Notwithstanding the value in understanding school leadership in an integrated manner drawn from broader perspectives, three school leadership models seem to stand out. These are: (1) transformational leadership, (2) instructional leadership, and (3) distributed leadership.

11.2.1 Transformational Leadership

Transformational leadership in education has been researched over the last two decades. Drawing from Burns' (1978) conceptions of transformational leadership, Leithwood and his colleagues (Leithwood, 1994; Leithwood et al., 1999) established eight dimensions of transformational leadership consisting of (1) identifying and articulating a vision, (2) fostering the acceptance of group goals, (3) providing individualized support, (4) intellectual stimulation, (5) providing an appropriate model,

(6) high-performance expectations, (7) strengthens school culture, and (8) builds collaborative relationships. 'Identifying and articulating a vision' involves leaders' behaviors aimed at identifying new opportunities for their school and developing, articulating and inspiring others with a vision of the future (Jantzi & Leithwood, 1995, p. 515). 'Fostering the acceptance of group goals' involves leaders' behaviors aimed at promoting cooperation among staff and assisting them to work together toward common goals (Jantzi & Leithwood, 1995, p. 515). 'Providing individualized support' involves leaders' behaviors that indicate respect for individual members of staff and concern about their personal feelings and needs (Jantzi & Leithwood, 1995, p. 515). 'Intellectual stimulation' involves leaders' behaviors that challenge the staff to reexamine some of the assumptions about their work and to rethink how it can be performed (Jantzi & Leithwood, 1995, p. 515). 'Providing an appropriate model' involves leaders' behaviors that sets an example for staff members to follow consistent with the values the leader espouses (Jantzi & Leithwood, 1995, p. 515). 'High-performance expectations' involve leaders' behaviors that demonstrate the leader's expectations for excellence, quality, and high performance on the part of staff (Jantzi & Leithwood, 1995, p. 515). 'Strengthens school culture' involves leaders' behaviors that demonstrate the leaders' expectations for staff participation, the sharing of power and responsibility of others, promotes an atmosphere of caring and trust among staff, frequent and direct communication, clarification for school's vision and norms of excellence (Leithwood, 1994). 'Builds collaborative structures' involves leaders' behaviors that demonstrate the willingness of the leader to share in responsibility, power, and decision making, which includes staff's opinions when making decisions and that ensure effective group problem-solving, provides autonomy for teachers in their decisions and alters working conditions to ensure that staff have collaborative planning times (Leithwood, 1994).

11.2.2 Instructional Leadership

Instructional leadership in education has been researched upon since 1980. Hallinger (2005) claimed that instructional leadership is 'still alive in the domains of policy, research, and practice in school leadership and management' (p. 221) attributing this to the rise in global emphasis on school accountability. Hallinger's conceived instructional leadership as a role carried out by school principals (Hallinger & Murphy, 1985). Instructional leaders are viewed as strong, directive leaders; culture builders; goal-oriented in terms of student academic outcomes; focusing both leading and managing; hip-deep in curriculum and instruction; and working directly with teachers to improve teaching and learning (Hallinger, 2005). Further, instructional leadership has three core dimensions: (1) Defining the schools' mission, (2) Managing the instructional program and (3) Promoting a positive school learning culture, which are further delineated into ten instructional leadership functions (Hallinger, 2005). They include the following:

(I) Defining the schools' mission

i. Framing the school's goals
ii. Communicating the school's goals

(II) Managing the instructional program

iii. Supervising and evaluating instruction
iv. Coordinating the curriculum
v. Monitoring student progress

(III) Promoting a positive school learning culture

vi. Protecting instructional time
vii. Promoting professional development
viii. Maintaining high visibility
ix. Providing incentives for teachers
x. Providing incentives for learning.

However, in his re-conceptualization of the instructional leadership construct, Hallinger (2005, p. 233) proposes seven aspects of focus for school leaders. They are as follows:

1. Creating a shared sense of purpose in the school, including clear goals
2. Focused on student learning
3. Fostering the continuous improvement of the school through cyclical school development planning that involves a wide range of stakeholders
4. Developing a climate of high expectations and a school culture aimed at innovation and improvement of teaching and learning
5. Coordinating the curriculum and monitoring student learning outcomes
6. Shaping the reward structure of the school to reflect the school's mission
7. Organizing and monitoring a wide range of activities aimed at the continuous development of staff; and being a visible presence in the school, modeling the desired values of the school's culture.

11.2.3 Distributed Leadership

Unlike transformational and instructional leadership, interest and research in distributed leadership in education has been more recent even though the concept has been in the management literature for some time (Gronn, 2000; Harris, 2004; Harris & Spillane, 2008). Hartley (2007, 2009) observed that the rise to prominence in distributed leadership can be attributed to contemporary reforms in the public service that demands greater 'joined-up' or 'network' regime of governance—a societal culture wherein (i) all categories and classifications are weakened and rendered increasingly permeable (a flexible 'liquid modern' view of space and time) and

(ii) the new work order consistent with the knowledge economy (where individuals work and learn beyond bureaucratic enclosures using their loose spatial and temporal codes). These changing work contexts are consistent with the three kinds of roles emerging within changing policy environment, that is—enhanced line roles, project roles and networking roles (Simkins, 2005). Specifically, the attraction of distributed leadership in education lies in its potential to bring about school improvement (Harris, 2007, 2011, 2012; Spillane & Healey, 2010). Claims have also been made on distributed leadership's potential impact on instructional aspects of leadership (Elmore, 2000; Lieberman & Miller, 2011; Smylie et al., 2002; Spillane & Louis, 2002) and leveraging on instructional improvement (McBeth, 2008; Murphy & Datnow, 2003; Timperley, 2005). Distributed leadership, along with transformational leadership, has also been claimed to supersede transactional leadership in influencing school climate and environment and enhancing the instructional capacities of teachers (Jones et al., 2012; Spillane et al., 2001). Although the literature remains agnostic about its impact on student achievement because of insufficient empirical data (Bennett et al., 2003), its potential to do so remains intuitively attractive, compelling and positive (Gronn, 2008; Leithwood et al., 2006). As such it is not surprising that distributed leadership is endorsed by many as good practice (Hopkins, 2001).

11.2.4 School-Based Curriculum Development (SBCD)

Notwithstanding the prominence of transformational, instructional and distributed leadership models for effective schools, the question that needs answering is whether and how the manifestations of such leadership practices are critical in supporting schools seeking to initiate, develop and sustain school-based curriculum development for curriculum innovation. First and foremost, it is instructive to take note that school-based curriculum development (SBCD) has been around since the 1970s and 1980s prior to the onset of centralized curriculum and national standards in predominantly western countries such as Canada, USA, UK and Australia. On the flipside, its importance in non-western education systems has grown only in the last decade or so (Kennedy, 2010). SBCD has been defined in different ways. It has been defined as the 'planning, design, implementation and evaluation of a programme of students' learning by the educational institution of which those students are members' (Skilbeck, 1984, cited in Marsh et al., 1990, p. 48). It has also defined as

> a process in which some or all of the members of a school community plan, implement and/or evaluate an aspect or aspects of the curriculum offering of the school. This may involve adapting an existing curriculum, adopting it unchanged, or creating a new curriculum. SBCD is a collaborative effort which should not be confused with the individual efforts of teachers or administrators operating outside the boundaries of a collaboratively accepted framework. Bezzina's (1991, p. 40)

Further, the OECD defined SBCD as

> any process which – on the basis of school-initiated activity or school demands regarding curricula – brings about a redistribution of power, responsibilities and control between central and local educational authorities, with schools acquiring the legal and administrative autonomy and the professional authority enabling them to manage their own process of development. (OECD, 1979, p. 4)

The combination of the definitions provided by Skilbeck (1984), Bezzina (1991) and the OECD (1979) seems to imply that curriculum development processes can involve members within (e.g., local—school teachers and leaders) and outside school contexts (e.g., central—district superintendents, officials at headquarters). What is at the core of SBCD is that curricular decisions must involve members within schools, which could involve teachers, leaders, students and parents. On the flipside, however, curricular decisions do not rest entirely within schools. This balanced or middle perspective on SBCD has been highlighted by Marsh et al. (1990). Notwithstanding the distinction between school's autonomy versus central education's authority in matters of curricular decisions (Bolstad, 2004), SBCD is said to be an appropriate response to centralized curriculum which tends to neglect the diverse needs of teachers and students in their respective school contexts (Marsh, 1992).

Granted that research on SBCD has been more pronounced in Western education contexts, it would be interesting to investigate how schools in Asian education contexts with centralized education systems enact SBCD. In Singapore, where the education ministry has been encouraging greater school autonomy on school-based curricular decisions over the last decade or so—especially since the introduction of the 'Teach Less, Learn More' (TLLM) policy initiative, SBCD has taken a unique form. This is a result of policy initiatives which started since the mid-1990s (Gopinathan & Deng, 2006)—specifically, in the era of 'Thinking School, Learning Nation' (TSLN) starting in 1997. In their analysis of SBCD in Singapore, Gopinathan and Deng (2006) understood SBCD more as '*school-based curriculum enactment*' whereby school leaders and teachers adapt, modify and translate the externally developed curriculum materials (e.g., syllabi, textbooks and resources) from the education ministry, and in doing so, participate in the 'creation' of a new curriculum product. This will then result in the production of 'educative' curriculum materials which have the potential to support teacher as well student learning. In acknowledging this potential, Gopinathan and Deng (2006) suggested drawing inspiration from the use of nine heuristics by Davis and Krajcik (2005), albeit within science teaching. They are as follows.

1. Support teachers in engaging students with topic-specific scientific phenomena.
2. Support teachers in using scientific instructional representations.
3. Support teachers in anticipating, understanding and dealing with students' ideas about science.
4. Support teachers in engaging students in questions.
5. Support teachers in engaging students with collecting and analyzing data.
6. Support teachers in engaging students in designing investigation.
7. Support teachers in engaging students in making explanations based on evidence.

8. Support teachers in promoting scientific communication.
9. Support teachers in the development of subject matter knowledge.

The key idea or purpose behind 'educative' curriculum materials is to design curriculum materials that enhance teachers' understanding of students and content, increase curricular and pedagogical resources, help teachers find productive ways of adapting materials in classroom contexts, enhance teachers' abilities to respond to particular needs of students and strengthen the role of teachers as curriculum developers to enhance meaningful curriculum experiences (Gopinathan & Deng, 2006). In addition to promoting 'educative' curriculum materials, investing in teacher professional development has also been suggested.

The question that needs answering is 'Does school leadership matters in SBCD'? While the discussion on school leadership above seems to support that school leaders and school leadership do indeed play a significant role in supporting SBCD, how they do so in educational reform contexts that are increasingly characterized by intensity, rapidity, fluidity, uncertainty and complexity is yet to be understood fully at the ground level. This study therefore sought to give greater in-depth understanding of the complexities involved in SBCD within an education system that seeks to find the right balance within the centralized–decentralized continuum. The study centrally asks, '*What are school leadership practices that support school-based curriculum development processes?*'.

11.3 Method

The study made use of qualitative focused-group interviews (FGIs) to collect data from participants belonging to one public primary school—Technology Primary School (*fictitious name*). There were altogether five FGIs: one for the principal and vice-principal, two for the middle managers, and two for the teachers. In total, 23 participants took part in the FGIs—two school leaders, ten middle leaders and 11 teachers. The teachers who participated in the FGIs were chosen by the school leaders based on the specific curricular innovations that they were exposed to. The school was among other schools in Singapore that were involved in a nation-wide curriculum innovation programme using information communication technology (ICT). The purpose of using FGIs was to gather and generate in-depth information on the processes of curriculum development through conversations among school participants with similar experiences. The conversations that took place for each FGI were guided by a set of semi-structured questions. Each FGI was audio-taped and transcribed. The transcripts from the FGIs were chronologically coded to arrive at themes and categories. These themes and categories were developed taking into consideration coherence to generate findings focusing primarily on how school leadership support curriculum development processes.

Technology Primary School was established in 2000 and is located in one of the residential estates in the north region of Singapore. The school is considered a

'mainstream school'—that is, with the following characteristics: (1) located within a public housing estate, (2) not affiliated to any religious or ethnic group and (3) does not have special status identifiers such as the Special Assistance Programme (SAP). It was headed by a principal who was assisted by three vice-principals (one VP academic and two VP administration). The school had about 101 teaching staff and about 1800 student population. In 2007, the school was selected to participate in a nation-wide ICT programme to lead the way in harnessing technology so as to enhance student learning. Prior to this, the school was progressively recognized for their exploration and experimentation in ICT for teaching and learning. Besides using technology as a medium for teaching and learning, the school had also used technology to support the school-wide approach in curriculum integration which cut across grade levels (e.g., Primary 3 and 4), content subjects (English and Social Studies) and school programmes. The school aimed to develop (1) students' learning strategies in questioning and inquiry skills, (2) students' media literacy, global and cultural awareness, communication skills and active citizenry and (3) students' self-responsibility and self-management of students' holistic health. The school had also worked with industrial partners to develop a range of ICT applications—specifically, 4Di/3Dhive, Imprints and Learning Objects.

11.4 Findings and Discussion

The findings from the study showed that a myriad of school leadership practices had played a significant role in supporting SBCD. These leadership practices encompass strategic leadership, instructional leadership, distributed leadership, teacher leadership and network leadership. The findings were also consistent with the assertion by Hendricks and Scheerens (2013) that school leadership has become more diverse, eclectic and integrated.

11.4.1 Strategic Leadership Supporting SBCD

The findings highlighted the importance of strategic leadership in supporting SBCD. It showed the importance of the school principal, along with the support of his vice-principals, in developing a coherent long-term vision on teaching and learning using technology based on the previous school principal's initial work which started in 2007. The main challenge that the principal faced when he took over in 2009 was to develop the curricular work which he did not initiate. Although he needed to make necessary changes as he deemed fit, he would need to take into consideration the contexts in which the previous principal had established to maintain stability in the change process. The ability to see the importance of continuity in order to sustain curricular changes is akin to having long-term future, seeing the bigger picture and understanding the current contextual setting of the organization, and is a key

characteristic of strategic leadership (Brent & Davies, 2004). In understanding the current contextual setting of the organization, the principal saw the importance of enacting real change as opposed to superficial change. This was in specific regard to changes that are considered meaningful to his teachers. The following comments made by the principal illustrate this finding.

> For the two years, I observed how curriculum integration is done in this school. It's something really not out of the intent just to showcase but the intent is to practice. I think this is the difference because when you practice, teachers believe, and because teachers believe in curriculum integration, the integration of ICT becomes more meaningful. Otherwise, the ICT will be seen as an intruding factor. (Principal)

The second aspect of strategic leadership that was salient in the findings was the principal's ability to determine effective strategic intervention points. The first strategic intervention point was the "Team 1, Team 2" strategy. When the principal took over the school, he saw the strategic need to renew existing teams (Team 1) working on their ICT applications by injecting new team members (Team 2) to Team 1. Team 2 members were tasked to support, continue and succeed the work of Team 1 members. This strategy serves to heighten accountability among team members and increase the competency of team members in developing ICT applications through role modeling by Team 2 teachers. The sole purpose of using the 'Team 1, Team 2' strategy is essentially to make sure that the development of ICT applications was completed.

> I will have a Team 2 effect whereby Team 1 is the one that is developing the first generation, for example 4Di … I have a Team 2, another two more members to learn from the first team. But they are not just following. They're developing new themes … So when I meet Team 1 and Team 2 I see their methodology is quite different. (Principal)

The second strategic intervention point was the 'Roll-out' strategy, which capitalized on the idea of continual and progressive development of ICT applications. In this regard, the development of ICT applications could start at Term 1 school calendar year, then to be further developed in Term 2 school calendar year and then the second semester of the school calendar year. Another way of 'rolling-out' is to start the development of ICT applications at one grade level and then to be tried out at another grade level. A key advantage to this strategy is that the planning, designing, implementing and reviewing of the curriculum can be done on the go in gradual progressions and in small doses, as opposed to one-time massive comprehensive change.

The fourth strategic intervention point was the 'Staged' strategy, whereby the development work of ICT applications was checked for quality in stages. Teachers in their respective teams developed their ICT applications with direction from team leaders, ICT champs (team members who were more knowledgeable in certain technologies, and championed the use of ICT) and HODs, with the support from vendors. The completed development work was then submitted to the respective HODs to value-add the work, which will then be endorsed by the vice-principal and principal—the former for quality in curriculum integration, and the latter for ICT applications.

The fifth strategic intervention point was the 'faculty-based' curriculum development strategy, whereby teams develop ICT applications with sensitivity to different faculties—grade level 1 and 2, 3 and 4 and 5 and 6.

The determination of the five strategic intervention points also showed the ability of the principal to translate strategies into action and aligning individual members in the organization to the future organizational state or position (Brent & Davies, 2004)—in this regard, the school's vision of curriculum integration using technology. The findings had not only highlighted the importance of strategic leadership in supporting SBCD, but also give further emphasis on the importance of strategic leadership—a leadership model which seemingly has not received much attention in recent times.

11.4.2 Instructional Leadership Supporting SBCD

The findings from the study showed that the school principal had supported SBCD through the enactment of instructional leadership practices. First and foremost, the findings pertaining to strategic leadership practices described above overlap with the findings on instructional leadership practices insofar there was clarity in defining the school vision and goals (Hallinger, 2005)—that is, curriculum integration using technology. Furthermore, the principal, along with his vice-principals, was cognizant of the importance of not only framing the school goals on curriculum integration using technology, but also communicating these school goals—as illustrated in the comments below.

> I think we also aim for clarity in terms of direction that we are taking. Why are we doing this? I think that this clarity is actually being passed down to the next in line, be it the KP (Key Personnel) or the teachers … Basically I want teachers to be very clear … They must be able to justify and the justification is very simple. If anything we do is for the sake of learning for our students, you are absolutely right and go ahead … Every day we meet – long or short, and when we meet, it's not about – I give instructions. It's about they telling me what to do (with regard to the development of ICT applications). (Principal)

The determination of strategic intervention points described above is also evidence of the dimension of instructional leadership on 'managing the instructional programme' (Hallinger, 2005) comprising (a) supervising and evaluating instruction and (b) coordinating the curriculum.

In addition to the instructional leadership practices that overlapped with strategic leadership practices, the principal also provided ongoing support in the development of ICT applications such as finance, expertise and networking. The ongoing nature of the support reflected not only the evolving nature of the development of ICT applications, but also with the primary purpose of supporting teaching and learning. The dialogue below highlights the support given by the school leaders.

> HOD A: They (principal and vice-principals) were not 'the boss' (directive), but they were very supportive of our ideas, yes. Very, very supportive.

HOD B: They (principal and vice-principals) gave us their full support. So whenever we need extra help, or whatever we can explore our ideas, ya, we can go to them.

HOD A: They were the ones who will get the MOE (Ministry of Education) and the ETD (Educational Technology Division) people to come down, and give guidance.

HOD A: Yhey were ready to support us – if it makes sense.

HOD B: Correct.

HOD A: Like HOD B says. It (curriculum development of ICT applications) has to be progressive. You just don't do something in isolation and then dump in. So as long as it helps our pupils – it makes a lot of sense – facilitate learning and teaching, of course the greater support it is.

Besides leadership support for teaching and learning, the school principal also provided guidance to the development of the ICT applications to be used for teaching and learning. The school principal, along with the vice-principals, played the primary role of 'advisors' which included strategic direction, giving guidance, consolidation of thought processes (e.g., resolving issues, clarifying ideas, reviewing outcomes)—as highlighted by a key personnel member.

But they (KPs) are also the ones that seek advice from the school leaders. The school leaders would say that, 'Okay, roughly these are the things that you can do.'

11.4.3 Distributed Leadership Supporting SBCD

Besides strategic and instructional leadership practices, the findings from the study also showed that the school principal had supported SBCD through the enactment of distributed leadership practices—specifically, in terms of empowerment of staff members, collective engagement and shared decision. With regard to empowerment, the principal distributed decision-making power on the development of ICT applications to various staff members in the school. One vice-principal academic was given the responsibility to coordinate the school-wide curriculum integration endeavor of the school taking into consideration the use of ICT applications, while the principal looked into overseeing the coordination of the development of ICT applications. In addition to this, the HODs had been given the responsibility to check the quality of the ICT applications created by teacher groups in context of the curriculum under their content subject jurisdiction. The role of HODs in this matter was considered a new introduction to the previous mode of curriculum development—as indicated in the following comments.

Okay. In the past, the model of decision making is one of the teachers are encouraged to initiate, then they have to collaborate and make collective decision. However, now the decision has been upscale. It's not just among teachers now but really with the HODs. This is the current model of change. (A key personnel member)

Among the teacher groups, team leaders played the role of leading fellow teachers in developing ICT applications allocated to them. This constitutes the second and third aspect of distributed leadership—that is, collective engagement and shared

decision. Teachers working in their respective ICT application teams collectively work together to reach shared decisions on the merge between technologies and pedagogies.

The findings of the study on distributed leadership are interestingly consistent with claims made by educational leadership theorists that there is a close connection between instructional and distributed leadership (Lieberman & Miller, 2011; Spillane & Louis, 2002; Timperley, 2005)—albeit more indirect than direct. In this study, different staff members enacted different emphases on instructional leadership. The principal played a more indirect role in impacting the teaching and learning through direction setting, guidance, support and monitoring in the development of ICT applications. The vice-principal played an indirect role in impacting teaching and learning through guidance and monitoring in the development of ICT applications. The HODs played the role of ensuring that ICT applications were developed within the context of the content subject curriculum. The team leaders played the role of leading the direct development of ICT applications for teaching and learning. This synergistic operation is consistent with Gronn's notion of 'concertive action' (or holistic)—and what Spillane terms 'person plus' synergistic relationship (Spillane, 2006), as opposed to 'additive action'. While the latter is the aggregated effect of a number of individuals contributing their initiative and expertise in different ways to a group of organization, the former is about the additional dynamic which is the product of conjoint activity and where the outcome is greater than the sum of individual actions (Bennett et al., 2003; Gronn, 2002). Decisions made by empowered subordinates across all levels in the school organization were coordinated in ways that achieve alignment with the school goals.

Besides distributed leadership being related to instructional leadership, the findings of the study also raised the importance of teacher leadership in the development of ICT applications. Teacher leadership can be defined as 'the process by which teachers, individually or collectively, influence their colleagues, principals and other members of school communities to improve teaching and learning practices with the aim of increased student learning and achievement' (York-Barr & Duke, 2004, pp. 287–288). With regard to construct dimensionality, three dimensions for teacher leadership had been identified (Hairon, 2014; Hairon et al., 2015)—(1) building collegial and collaborative relationship, (2) promoting teacher learning and development and (3) enabling change in teachers' teaching practices. However, the findings from the study did not surface these three aspects of teacher leadership in its richness and depth. This could suggest the lack of investment in developing leadership in staff members for the development of ICT applications vis-à-vis the second dimension of distributed leadership (Hairon & Goh, 2015).

11.5 Conclusion

This study has shown that school leadership has played a significant role in supporting SBCD through the enactment of several leadership types or models—specifically,

strategic leadership, instructional leadership, distributed leadership and teacher leadership. The study has also shown that the enactment of these leadership practices works in a collective sense to support SBCD. The configuration on the enactment of these leadership practices also indicates the Singapore context of SBCD, which privileges pragmatism and efficiency. The emphasis on strategic leadership practices depicts the need for efficient use of school resources to achieve the desired organizational goals. The emphasis on instructional leadership depicts the focus on improvements on nothing less than teaching and learning. The emphasis on distributed leadership further depicts the importance placed on role specializations to secure the development of ICT applications—the production of 'educative curriculum' to support the 'school-based curriculum enactment' which Gopinathan and Deng (2006) had argued for. The form of empowerment is also 'bounded' (Hairon & Goh, 2015) in the sense that all decisions pertaining to teaching and learning must be within the scope of acceptability insofar as they fit within the departments' and overall school's curricular goals. The study had also surfaced the importance of building leadership capacity to sustain SBCD, especially that of teacher leadership. Finally, underlying the enactment of leadership practices is the philosophy—or set of beliefs, that school leaders cherish, in their day-to-day practices. The principal in this study held a strong belief on making the curriculum meaningful and enjoyable for students—which essentially constitute his vision and inner drive for school-based curriculum development.

> And the day that they (students) are introduced to games (in school) is how they will sink into it. Or those that are now already playing games. There're some very good gamers. The good gamers when they are into it (games) they will forget the rest of the world. They come in to school – is like a CCA (Co-Curricular Activity). Their main core learning is at home playing games. Some are very balanced. They come to school, they play games. It's like a social thing but they also study very hard. Ah, this student, we must see how they can help each other. (Principal's view on games for learning in school)

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