TABLE OF CONTENTS

03  FOREWORD
04  INTRODUCTION
09  KEY FINDINGS
16  RECOMMENDATIONS
24  ANNEXES
The Office of Education Research (OER) as the National Institute of Education’s (NIE) key education research arm, has been committed for the twelve years it has been in existence to leading NIE’s efforts in providing research on education that is timely and relevant to Ministry of Education (MOE) officials, policymakers in government and even other ministries working on related issues.

The aim of the Local Evidence Syntheses (LES) Series is to make the results of our research available in a concise and digestible manner to such interested readers in order to inform policy formation, programme design and pedagogical practice in the education realm in Singapore. It does this by synthesising our research that is funded by the Education Research Funding Programme (ERFP) according to key themes of domestic interest and according to how they contribute to their specific fields of research. Key insights are distilled from the jargon and academic-speak that makes most academic publishing opaque and inaccessible. Future directions are also sought from authors to suggest what we can do or look out for in order to bring our education system to the next level.

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LEADERSHIP INVOLVES DELIBERATELY EXERTING SOME FORM OF INFLUENCE ON PEOPLE TO IMPACT THEIR BELIEFS, VALUES AND ACTIONS TO ACHIEVE DESIRED ORGANISATIONAL OUTCOMES (POUNDER, OGAWA, & ADAMS, 1995). IN THE SCHOOL CONTEXT, LEITHWOOD AND RIEHL (2005) DEFINED LEADERSHIP AS “THE WORK OF MOBILIZING AND INFLUENCING OTHERS TO ARTICULATE AND ACHIEVE THE SCHOOL’S SHARED INTENTIONS AND GOALS” (P. 14). DEFINED AS INFLUENCE, LEADERSHIP CAN POTENTIALLY BE PRACTISED BY ANYONE, WHETHER IT IS SCHOOL LEADERS (PRINCIPAL AND VICE-PRINCIPAL), MIDDLE MANAGERS (HEADS OF DEPARTMENT AND SUBJECT HEADS), FORMAL TEACHER LEADERS (MASTER TEACHERS, LEAD TEACHERS AND SENIOR TEACHERS), OR INFORMAL TEACHER LEADERS, WHO EXERT INFLUENCE ALTHOUGH THEY HAVE NO OFFICIAL TITLES.

Indeed, the concept of distributed leadership has been gaining hold both in the scholarly literature and in practice; given the growing complexity involved in leading. Besides the principal, past research has increasingly brought to the fore the importance of leadership by middle managers and teacher leaders, both formal and informal (Bennett et al., 2003; Hairon, 2017; Koh, Gurr, Drysdale, & Ang, 2011; Murphy, 2005; Turner, 2003; York-Barr & Duke, 2004). Empirical evidence, however, has yet to catch up with claims made for the benefits of distributed leadership (Hairon & Goh, 2015; Ho, Chen, & Ng, 2016; Leithwood et al., 2007; Spillane, Halverson, & Diamond, 2004).
A leadership construct that is prominent in our local studies is *instructional leadership*. This is categorised into two general concepts (Sheppard, 1996):

1. Instructional leadership as actions that are directly related to teaching and learning, such as conducting classroom observations.

2. All leadership activities that indirectly affect student learning by impacting the quality of curriculum and instruction delivered to students, including developing a school culture conducive to both student and teacher learning (Goldring & Greenfield, 2002; Ng, Nguyen, Wong, & Choy, 2015).

Consistent with distributed leadership, there is a growing move from the principal as the sole instructional leader to sharing the instructional leadership with teachers by encouraging teacher agency to initiate and sustain change (Blase & Blase, 2004; Hairon & Goh, 2017; Harris & Muijs, 2003; Marks & Printy, 2003).

Although research on leadership in schools has been expanding over the last decade, the literature is predominantly western-centric (Goh et al., 2015; Hairon & Goh, 2015; Nguyen, Ng, & Yap, 2017). Leadership practice has generally been argued to be strongly shaped by contextual factors (Gumus et al., 2018). The Singapore educational context is unique in that there is a strong tripartite relationship between the Ministry of Education (MOE), schools and the National Institute of Education (NIE). Singapore schools thrive in a seemingly paradoxical structure of centralised decentralisation (Ng, 2017; Tan & Ng, 2007), with MOE providing leadership at the system level (Leithwood et al., 2007; Togneri, 2003) and schools progressively given more autonomy to make pedagogical decisions that meet their specific needs. There is a constant need to align top-down policy intent with bottom-up contextualised school policies, to balance subject content mastery and 21st century competencies, and to ensure the sustainability of transformation as opposed to episodic changes. Thus, there is a need for an indigenous leadership concept which can uniquely explain the constellation of leadership practices that enable Singapore to not only sustain its past stellar performance in international benchmarking evaluations, but also to achieve future student learning outcomes that are more germane to the future economy and society.
Current state of research on school leadership and organisation

14 ERFP studies related to leadership and school organisation were completed between 2010 and 2018.

10 of these studies were Baseline and Exploratory. 4 studies were Explanatory. They also varied in nature ranging from studies of the diffusion of specific innovations/policies to studies on different leadership practice such as instructional and distributed leadership, to studies on teacher leadership.

57% of these studies were Tiers 2 and 3.

About $3M or 4% of 2nd and 3rd tranche ERFP approved funding was spent on the 14 studies related to leadership and school organisation research.

A total of 29 ERFP and 2 relevant eduLab studies were analysed to derive the findings for this report. (Refer to Annex A for a summary of all 31 studies. The 14 studies are indicated with bold and italics.)
References


To expand and deepen teachers’ pedagogical competency, school leaders must develop a school culture that supports teacher agency and teacher reflective learning in an environment that is collaborative, open and safe (1, 7, 12, 23, 24, 26). Effective school leaders provide teachers with opportunities to craft curriculum, enculturating them to view curriculum as a fluid process, and through this, develop teachers’ capacity to be both designers and assessors of curriculum (23, 24). Freedom to design and co-design the curriculum leads teachers to discuss questions related to the purpose of education, and what is at the heart of a subject discipline (28). Opportunities for teachers to collaboratively engage in such reflective dialogue, in the form of regular professional dialogic communities (10, 12, 20), is critical to facilitating changes in teachers’ epistemic beliefs which is about a person’s beliefs about the nature of human knowledge and the process of knowing. If there is no change in teachers’ epistemic beliefs about how students acquire, understand and use knowledge, there is unlikely to be substantial or sustained change in teachers’ practices. Change in teachers’ epistemic beliefs is potentially the highest lever for school leaders to promote sustainable improvement in teachers’ practice.

To increase teachers’ self-efficacy, school leaders must develop a school culture that allows staff to take initiative and make mistakes (12). Although there appears to be a dependency on principals (2, 3, 12, 24), vice-principals and teachers highlighted school culture as a key factor influencing their self-efficacy (12). Self-efficacy refers to individuals’ belief in their innate ability to achieve goals and thus the likelihood of them acting to achieve these goals. By encouraging risk-taking and experimentation, and by providing opportunities for teachers to openly discuss diverse and dissenting opinions, struggles, successes and failures (1, 23, 24, 26), principals support teacher agency. Research suggests that teacher agency is a key lever that principals can use to deepen and sustain educational innovation (23).
**#2 Effective school leaders distribute instructional leadership**

There has been a distribution of instructional leadership not only to middle managers, but also to teacher leaders, both formal and informal (10, 12, 13). Instructional leadership practices are supported by distributed leadership practices constituting the following dimensions: empowerment, developing leadership, shared decisions and collective engagement (10, 13). When school leaders empower middle managers and teachers by relinquishing decision-making power on instruction, they support the sharing of decisions on instruction, and collective engagement amongst staff members to work collaboratively. At the same time, relinquishing decision-making power necessitates the development of leadership competences in staff members.

Distributed leadership has been shown to improve students’ academic outcomes, as illustrated by a study investigating the relationship between distributed leadership and Primary 5 students’ learning growth in Mathematics and English (13). A related study further showed that school leaders’ distribution of leadership empowers teachers and supports the development of teacher leadership practices, which leads to changes in teaching practices (10). Teacher leadership is defined as influence enacted by teachers primarily on fellow teachers towards shared goals on teaching and student learning outcomes (10, 11). Teacher leaders have been found to support teachers’ collective learning, such as through professional learning communities and workshops, where teachers are encouraged to reflect on their teaching practices and apply these to their respective classrooms, eventually impacting students’ learning (10). The distribution of instructional leadership, through formal and informal teacher leaders, can thus be said to support the work of school leaders and middle managers in enabling change in teaching practice, which then impacts students’ learning (9, 10, 11, 12).

Besides the importance of teacher leaders in impacting teaching practices, another important intermediary in instructional leadership is middle management (2, 8, 12, 15, 27). School principals generally subscribe to a high power distance (12), in which less powerful members of organisations accept that power is distributed unequally, with more power held by people of higher rank in the hierarchy. However, principals are willing to relinquish some decision-making power to middle managers to allow for “layered accountability” (12, p. 116), usually in relation to curriculum and instruction. The middle managers in turn share this power
with formal and informal teacher leaders, empowering the former to drive curriculum and instruction implementation (10). Middle managers also contribute to building a culture of learning and innovation (1, 2) amongst teachers by encouraging the sharing of both good and bad experiences, fundamentally “de-privatising pedagogical practices and de-personalising the risks of experimentation” (27, p. 19). In general, there seems to be agreement in the local research findings that instructional leadership is effective when it is distributed at the teacher and classroom levels (10, 13).

Furthermore, there is evidence that involving teachers in a school-based curriculum innovation encourages the emergence of teacher leaders beyond those who are official appointment holders (10), and a more distributed form of leadership reinforces the culture of learning amongst teachers (1, 11). With teachers expressing a desire for more flexibility and autonomy, the need to innovate curriculum to develop 21st century competencies, and the growth of teacher leaders, school leaders need to review the extent or scope of empowerment they currently provide to middle managers, teacher leaders and teachers in making key curricular, instructional and assessment decisions (12, 24). School leaders also have to strategise which specific instructional leadership practices (e.g., building collegial and collaborative culture, developing staff members, impacting classroom teaching) are to be distributed to which distributed leadership roles in order to optimise the synergy amongst these instructional leadership practices (10).

The development of distributed instructional leadership needs to be strengthened and expanded (13). There are already indications that the perception of an innovation barrier increases for staff further down the hierarchy (28), suggesting the need to pay greater attention to the implementers of education reform at the ground level. In one early study, teachers perceived principals to be risk averse, hence they were afraid to independently make decisions (12). They preferred school leaders to set the direction and initiate change (3, 24). This is consistent with the Asian value for hierarchical work relationships. However, over time, teachers’ value of observing hierarchical work relationships may be diminishing, with teachers increasingly expressing that they would like to have more flexibility and autonomy in interpreting and implementing policies, especially for classroom teaching (13). Thus, there is a clear need for more distribution of instructional leadership practices from middle managers to teacher leaders.
The distribution of leadership through middle managers and teacher leaders increases the proximal connections and psychological ownership across different ecological levels (11, 13, 26). Ecological levels in an education system refer to the classroom at the micro level, the school at the meso level, the cluster and other partners at the exo level, and the ministry and system policies at the macro level. Middle managers have the potential to influence both upwards and downwards (2, 15), particularly since the power distance between middle managers, teacher leaders and teachers is lower compared to the power distance between school leaders and teachers (3, 10). In a study of 11 primary schools, which found that community-based teacher learning has an impact on student learning outcomes, one critical success factor was what the researchers referred to as “synergistic leadership support across all levels of the school organisation” with regard to setting direction, (re)designing the organisation, monitoring, and providing human and physical resource support (11, p. 6). In another study, researchers found that providing teachers with the flexibility and autonomy to interpret and adapt MOE’s policies for classroom practice was a predictor of students’ learning growth in Primary 5 Mathematics (13), supporting the importance of psychological ownership by teachers of macro level policies. Similarly, a study on MOE’s implementation of the third ICT Masterplan found that many schools adopted “multi-level leadership”, a mix of top-down and ground-up approaches, to encourage teacher ownership in integrating technology into their lessons (26, p. 14). Leadership practices can thus be better understood in an interdependent and inter-related multi-level (i.e., different ecological levels) sense.

School leaders capitalise on partnerships both within and beyond the school system, leveraging the larger societal ecology to achieve the goals of 21st century student competencies (1, 2, 5, 14). In a study on partnerships with the community, two models appear to support the scaling of educational innovations (5). The first is the distributed model which enables teacher learning pertaining to innovation by capitalising on expertise beyond the school. The second is the consortium model which involves a higher intensity of intra and inter school communication at multiple levels of the ecological system, harnesses external expertise and pools resources from partnership schools, enabling teachers to adapt the educational innovation to

#3 Effective school leaders leverage multiple ecological levels
their local needs. The consortium model is similar to the seeding-seeded relationship amongst a community of six schools (15) in which there were ties not just amongst school leaders, but also amongst teachers in a joint teacher learning community. There was intensive and coordinated effort amongst the schools to build teachers’ capacity, establish support structures, and communicate the innovation to stakeholders. In a study on partnering with parents to support lower-achieving students (14), the findings suggested the importance of school leaders providing a strategic vision for the school’s partnership with parents and role modelling a strong commitment to this partnership. School leaders also need to develop staff capacity to learn how to communicate with parents (14).

The adoption of multi-level leadership assists in the translation of direction into teaching and learning practice, and encourages the ownership of curricular innovations (6, 12, 26, 31). At the macro level, there are indications that schools prefer MOE to provide clear criteria, specific milestones, and guidelines for policy changes. They also prefer MOE to provide support in terms of communication, training and resources, which can be operationalised through the cluster at the exo level (2, 3, 26). Superintendents are perceived as influential in helping principals define educational goals (12). At the meso level, school leaders need to be clear about the intent of policies so they can contextualise and provide direction for their schools (2, 3), aligning school professional development goals to system goals while simultaneously fulfilling the national agenda (8). To promote curriculum innovation and develop adaptive capacity, school leaders conceptualise a curriculum vision to enable middle managers and teachers to reframe the curriculum with broader curriculum objectives (5, 22, 23, 24).

A multi-level and ecological perspective of leadership has the potential to influence the spread and sustainability of educational innovations both within and across schools, driven by a common moral purpose, collaborative social capital and shared resources at a system level (5). However, leadership from teachers currently lacks the upward percolation as teachers feel uncomfortable to make decisions, take the risk to experiment with educational innovations, challenge their school leaders’ view or provide negative feedback to superiors (3, 12).
Broad-based leadership development is critical for effective school leadership

The sustainability of distributed instructional leadership within the perspective of ecological leadership is eventually dependent on quality leaders (11, 12, 13). Distributed leadership can only be effective if leaders at various levels have the capacity to mobilise resources and influence others to work towards accomplishing a shared vision and goals. The development of leadership capacity is thus critical. A study which investigated the impact of distributed leadership on student learning outcomes was premised on the understanding that distributed leadership requires the development of leadership capacities to support and sustain the distribution of instructional leadership practices en route to student learning (11, 12, 13). While existing research emphasises the role of principals in promoting the professional development of Singapore teachers in general, particularly through professional learning communities, few studies have examined the development of teacher leaders in particular. To date, only one Tier 3 study completed in 2014 explicitly examined leadership preparation and development in Singapore for principals, vice-principals and heads of department (12). The findings from this study are elaborated in the following paragraph.

The professional development of leaders requires a mix of formal and on-the-job support and learning (12). Principals shared that the following experiences had been influential in helping them to become better leaders: on-the-job learning, networking, formal training, and reading (12). Some specific feedback was given on their Leaders in Education Programme (LEP) experience (12). Positive feedback included networking, 6 months of learning space, school attachment, time for reflection, overseas visits, reading, interactions with principals, and the Future School Project (since then re-designed as the Creative Action Project). However, there was also criticism of disjunctions between theory and practice, lack of relevance of some courses, and lack of feedback by NIE/MOE to vice-principals while on the course. All levels of leaders, principals, vice-principals and heads of department, emphasised the role of on-the-job learning in leadership development (12). In addition, vice-principals and heads of department perceived mentoring as important to their learning and development as a leader. More key personnel (compared to their principals) indicated that formal milestone leadership development programmes improved their leadership practice in working with stakeholders, teaching and
learning quality, motivating and nurturing teachers, developing school vision and building school culture with focus on innovation.

The professional development of teacher leaders needs to include pedagogical experimentation, situated and collaborative learning within a network setting, and the provision of dialogic space to critically examine professional practice (25). A study examined how the STAR champions programme developed teacher leadership in art and music so they could lead fellow teachers in their clusters in advancing their pedagogical understanding of student-centric education (25). The study found a three-pronged approach to develop teacher leadership:

a) inquiring into pedagogical practice, b) building a culture for teacher learning, and c) creating a culture for critical feedback and learning. The programme introduced thinking routines to scaffold the teachers’ pedagogical practice, encouraged teachers to exchange lesson ideas and experiences with one another, and encouraged teachers to reflect on how to appropriate the lessons based on their contexts. The study also found that the programme enabled teacher leaders to deepen their pedagogical knowledge as the latter had to share their experiences with teachers at the cluster level. One issue raised was that teachers did not seem to collect clear evidence about learner changes when they trialled new lessons.
RECOMMENDATIONS
Leadership practice

This synthesis of local studies lends strong support to three key propositions. First, that instructional leadership should remain the primary leadership model to support curricular and pedagogical developments and innovations in order to achieve a broad and diverse set of student learning outcomes suitable for Singapore’s future society and economy. Second, that distributed leadership supporting instructional leadership should be extended vertically to the classroom level through the development of formal and informal teacher leaders, and horizontally within and across departments and schools. Third, that leadership which builds school cultures must support teacher learning that is autonomous, collaborative, open and safe. These three aspects of leadership need to be further strengthened. Recommendations are made with these three key propositions in mind, with the relevant key finding(s) from above indicated in parenthesis.

The following school-level recommendations are put forward for school leaders:

1. Greater engagement with teachers on policy interpretation and implementation in the context of unique school vision, mission and goals

As education reforms are now dependent on teacher collective agency, the model of policy implementation where the top conceptualises and the bottom implements may not be fully effective. Teachers, who are the final implementers of education policies, need to have greater engagement in how policies are understood or interpreted in the context of their school’s vision, mission and objectives before these policies can be implemented successfully. School leaders thus have to provide the space for such teacher engagement, which would support school leaders’ effort to distribute instructional leadership (key finding #2).

2. More teacher agency in developing and innovating pedagogical practices

The need to strengthen teacher agency is becoming more apparent in light of
the transformations that are necessary in pedagogical practices. Stronger ownership by teachers to impact pedagogical practices in substantive ways is necessary in order to attain systemic and sustainable impact. School leaders will need to provide the necessary direction along with the necessary resources to support the growth of teacher agency, which would support the emergence of teacher leaders (key finding #2).

3. **Foster school culture that supports collaborative teacher learning**

In tandem with the development of teacher agency, it is equally important to foster a school culture that supports collaborative teacher learning. Interdependent relationships among teachers are necessary to coalesce and synergise teachers’ expertise, resources and effort in implementing effective pedagogical practices. While promoting teacher agency supports collaborative teacher learning, providing a safe and open culture for teachers to learn from one another is also needed to sustain collaborative teacher learning. At the same time, collaborative teacher learning can build teacher capacity in terms of breadth and depth of knowledge on teaching (e.g., curriculum content, pedagogy, and assessment). School leaders must continue to be strong culture builders, and promote specific cultural features critical in supporting teacher agency as they collaboratively learn, innovate and work together towards pedagogical innovations (key finding #1).

4. **Support teacher learning that facilitates teachers’ change in epistemic beliefs—that is, how people acquire, understand, justify, change and use knowledge-order to make significant shifts in pedagogical practices**

Although providing time and space for teacher learning is an important initial support structure, how teachers learn in ways that lead to significant change in their teaching is the next challenge. The pedagogical innovations that are necessary to impact deep student learning require transformations in how teachers acquire, understand, justify,
change and use knowledge in teaching. Furthermore, the increasing autonomy to be given to teachers to shape their pedagogical practices requires them to rigorously engage with one another to determine what really works in the classroom. School leaders need to consider the teacher learning strategies that support this epistemic change and provide opportunities for teachers to engage in reflective dialogue (key finding #1). An example is the use of action research or lesson study as potential sites to achieve transformations in teachers’ epistemic beliefs.

5. Provide more broad-based opportunities for teachers to develop leadership competencies

In order to develop more distributed instructional leadership for school-based curriculum development and innovation, structures (e.g., PLCs, NLCs) to bring teachers together are not enough. Leadership—that is, influence towards shared goals—is necessary to synergise the resources that teachers and all other stakeholders can provide to optimally support the necessary pedagogical innovations. School leaders need to consider building leadership competencies not only in formal and informal teacher leaders, but also in the broad-based teaching force. In this way, a continual supply of potential teacher leaders can be tapped on when the demand is needed. Besides the development of teacher leaders, the continual development of vice-principals and middle managers needs to be sustained. The broad-based development of different levels of leaders (key finding #4) support the distribution of leadership and also enables school leaders to leverage multiple ecological levels (key findings #2 and #3).

6. Giving greater focus on the development of teacher leaders’ competencies that have direct impact on classroom teaching

For distributed instructional leadership to function optimally, it must reach eventually to the classroom level where teaching and learning takes place (key finding #2). While teacher leaders provide professional development opportunities for teacher learning to take place, they need to be cognizant
that such learning must eventually make positive impact on classroom teaching and learning. In other words, the types of teacher learning that teacher leaders provide to teachers must make inroads into classroom teaching and learning. School leaders play a significant role in putting in place structures to support this linkage, and need to continue to look into supporting the primary roles of teacher leaders in general (building collegial and collaborative relations, developing professional learning, and creating impact on teaching and learning).

7. **School leaders to operate as network leaders for optimal resource mobilisation**

As the demands on schools continue to grow, the resources needed to support schools must grow concomitantly. School leaders now need to consider mobilising resources not only within but also beyond the typical school and cluster arrangements. They need to be adept in mobilising resources at the exo (e.g., cluster) and macro (system) levels. Most importantly, the synergising of these resources should optimally support school-based curriculum development and innovation efforts. School leaders need to develop a system mindset and disposition, become adept in building trust in partnerships and networks, and adopt an ecological perspective to school improvement (key finding #3).
While the seven recommendations above require principals’ actions at the school level, a system-level recommendation is proposed—specifically, the development of school leadership (principals, vice-principals, middle managers, teacher leaders) competencies to sustain school-based curriculum development and innovation. In their reviews of existing leadership development programmes such as Management and Leadership in Schools (MLS), Enhanced Leadership and Management Programme (LAMPLUS) and Leaders in Education Programme (LEP), MOE and NIE could assess if the competencies listed in the table below are being developed.

Furthermore, besides coverage of the listed competencies, the delivery mode needs to include both formal and informal learning. The latter should be situated in practice, with emphasis given to strengthen the theory-practice link.

1. **Communicating and engaging** with teachers on the interpretation and implementation of national education policies within school’s unique contexts

2. **Supporting** teacher-led pedagogical innovations

3. **Fostering** a culture of collaborative learning

4. **Creating structures** that support deep teacher learning that bring transformations in what and how teachers learn

5. **Creating structures** that support broad-based leadership development

6. **Identifying specific leadership practices** (top, middle and bottom) that have direct impact on pedagogical practices and innovations

7. **Growing competencies** in networked leadership
Leadership research

Based on the synthesis of local studies, future research studies pertaining to school leadership in Singapore could focus on the following areas:

1. **Leadership supporting school-based curriculum development and innovation towards a broadened or diverse set of student learning outcomes**

   While instructional leadership remains an essential leadership domain, future research studies will have to understand how specific distributed leadership practices support specific instructional leadership practices at various levels across leadership roles (principals, vice-principals, middle managers, and formal/informal teacher leaders) within the school and across schools, and how this eventually lends support to desirable curricular and pedagogical transformations.

2. **Leadership practices supporting effective education policy interpretation and implementation**

   In the centralised-decentralised education system of Singapore in which school leaders are encouraged to ‘lead nationally’ so as to provide quality educational experiences for students across all schools, and at the same time to provide curricula and pedagogies that are unique to each school’s needs, it is crucial that school leaders be adept at interpreting, communicating and implementing education policy initiatives and reforms that pertain to teaching and learning.

3. **Development of leadership competencies at all levels of leadership roles within the school organisation, especially to bring about transformations in classroom teaching and learning**

   In view of the importance of the distributed-ness of leadership support and the interdependency of various leadership roles within the ecological system, it is critical that studies investigating leadership roles and contributions of vice-principals, middle managers, and teacher leaders (formal and informal) match studies on school principals. Concomitantly, there should be investigations into the synergy amongst the leadership practices of various leadership roles in supporting curricular and pedagogical transformations.
4. **Leadership practices in strategic partnerships with key stakeholders**

An area of research that is in tandem with the distributed and ecological perspective on school leadership is the nature of leadership in school clusters and in school networks such as Networked Learning Communities. Specifically, investigations from the ecological perspective into leadership practices in such school partnerships would be useful to illuminate how various key stakeholders can be engaged to support the desired curricular and pedagogical transformations.

5. **Methods of research**

The synthesis of local studies seems to suggest the following potential areas for future research work on school leadership in Singapore:

- Besides the usual individual studies, there seems to be a need for a more programmatic approach to research work. Future leadership research studies need to, first, integrate the different aspects of school leadership and school improvement processes (e.g., instructional leadership, distributed leadership, school culture, teacher learning, etc), and, second, integrate the different fields of knowledge in education (e.g., subject content, pedagogy, assessment, motivation, technology, etc.).

- Future research studies on school leadership need to **draw from longitudinal data** in order to uncover the developments and processes at work and its effects.

- Future research studies need to draw from the **strengths of both quantitative and qualitative research methods** (e.g., mixed methods approach) to strengthen the rigour and richness of findings.

- Future research studies in school leadership need to go beyond describing and exploring phenomena relating to school leadership to **adopting an interventionist approach** so as to understand how international research studies and well-established theories relating to school leadership can be applied and studied in the Singapore education context.
• Regarding outcomes of research, this synthesis of local studies suggests the need to amplify and sustain the translation of research to benefit both policymakers and practitioners in a timely fashion. Besides the conventional publication avenues, future research projects could channel resources to provide timely research findings, even in preliminary versions, to research participants, but only if and when such practices do not interfere with the research process. Finally, future research studies can consider translating abstract, conceptual and theoretical idea into practical toolkits, frameworks or practical principles for research participants. Intervention studies seem to be most suitable for such an objective.

“It is critical that studies investigating leadership roles and contributions of vice-principals, middle managers, and teacher leaders (formal and informal) match studies on school principals.”

“It is crucial that school leaders be adept at interpreting, communicating and implementing education policy initiatives and reforms that pertain to teaching and learning.”

“Future research studies can consider translating abstract, conceptual and theoretical idea into practical toolkits, frameworks or practical principles for research participants.”
## ANNEX A

### Summary of Studies Analysed for the LES on School Leadership

<table>
<thead>
<tr>
<th>No</th>
<th>Principal Investigator (PI)’s Contact</th>
<th>Title of Study</th>
<th>Type of Study</th>
<th>Tier</th>
<th>Participants</th>
<th>Methods</th>
<th>Project Closure Date</th>
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<td>2</td>
<td>Christina Lim-Arasaratnam <a href="mailto:christina.ratnam@nie.edu.sg">christina.ratnam@nie.edu.sg</a></td>
<td>Peri Qualitative Case-Studies (Baseline) [OER 11/10 CL]</td>
<td>Baseline (MOE contracted)</td>
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<td>Schools - primary [3] - school leaders and teachers [160]</td>
<td>Qualitative Case Study Research</td>
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<td>David Hung Wei Loong <a href="mailto:david.hung@nie.edu.sg">david.hung@nie.edu.sg</a></td>
<td>Scaling as Innovation: Diffusion Models in the Singapore System [NRF2014-EDU001-IHL06]</td>
<td>Exploratory (EduLab)</td>
<td>3</td>
<td>N.A.</td>
<td>Meta-analysis of Case Studies</td>
<td>2018</td>
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<td>David Ng Foo Seong <a href="mailto:david.ng@nie.edu.sg">david.ng@nie.edu.sg</a></td>
<td>Instructional Leadership in Singapore and East Asia [OER 28/12 DN]</td>
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<td>Schools - primary - principals [30]</td>
<td>Meta-analysis of Local Literature in phase 1, Qualitative Study in phases 2 and 3</td>
<td>2016</td>
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<td>David Ng Foo Seong <a href="mailto:david.ng@nie.edu.sg">david.ng@nie.edu.sg</a></td>
<td>An Investigation of the Impact of Instructional Leadership Practices and School Culture on Staff Performance in Singapore Primary Schools [OER 22/14 NFS]</td>
<td>Explanatory</td>
<td>2</td>
<td>Schools - school leaders and key personnel [283] - teachers [468]</td>
<td>FGD and Quantitative Survey</td>
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<td>Infusion, Dissemination and Evolution: Seeding an Innovation from One School to a Few Schools [OER 26/12 LCK]</td>
<td>Scaling and Translation</td>
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<td>Schools - primary [5-6] - school leaders and teachers [12]</td>
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<td>Methods</td>
<td>Project Closure Date</td>
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<td>26</td>
<td>Tan Seng Chee <a href="mailto:sengchee.tan@nie.edu.sg">sengchee.tan@nie.edu.sg</a></td>
<td>Evaluation of Implementation of IT Masterplan 3 and Its Impact on Singapore Schools - Instrumentation and Baseline Study (Project Completed) [OER 03/08 TSC]</td>
<td>Evaluation</td>
<td>1</td>
<td>Schools [110] &lt;br&gt;- primary, secondary, JC &lt;br&gt;- students [7508]</td>
<td>Cross Sectional Design, Case Study Research</td>
<td>2010</td>
</tr>
<tr>
<td>No</td>
<td>Principal Investigator (PI)’s Contact</td>
<td>Title of Study</td>
<td>Type of Study</td>
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<td>Project Closure Date</td>
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<td>31</td>
<td>David Hung Wei Loong <a href="mailto:david.hung@nie.edu.sg">david.hung@nie.edu.sg</a></td>
<td>NRF2013-EDU002-STUDY01 Towards an Ecological Model of Scaling (EduLab)</td>
<td>Exploratory</td>
<td>3</td>
<td>School - primary [1] - principal, schools leaders and teachers [17]</td>
<td>Qualitative</td>
<td>2018</td>
</tr>
</tbody>
</table>

*Principal Investigators have left NIE

Studies in **bold and italics** are the 14 studies which selected “leadership and school organisation” as their primary or secondary niche
# ANNEX B

## Table on Research Types

<table>
<thead>
<tr>
<th>Research Type</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>Refers to studies that are descriptive and cross-sectional in nature which usually provide quantitative information on the current status of a particular situation - on whatever study topic - in a given population.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Refers to studies that assess the worth or effectiveness of new and existing programmes, procedures and/or interventions. May focus on the strengths and weaknesses as well as the overall “outcome(s)” or “change(s)”</td>
</tr>
<tr>
<td>Experimental</td>
<td>Refers to studies that manipulate conditions for the purpose of determining their effects on behaviour and to identify cause-and-effect relationships between variables. Most experimental research in education are quasi-experiments because researchers cannot exercise laboratory controls in natural-world settings or randomly assign subjects in schools.</td>
</tr>
<tr>
<td>Explanatory</td>
<td>Refers to studies that look for explanations of the nature of a phenomena or certain relationships, rather than to simply describe, the phenomena or relationships studied.</td>
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<tr>
<td>Exploratory</td>
<td>Refers to studies that investigate a problem or situation of which little information is available in order to gain better understanding and insights to the problem or situation.</td>
</tr>
<tr>
<td>Intervention</td>
<td>Refers to studies that include systematic change in conditions or procedures, or the manipulations of the subject or the subject’s environment to determine the effects on capacity, skill, or performance.</td>
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<tr>
<td>Scaling</td>
<td>Scaling Projects involve the efficient implementation of tested ideas in more sites. For example, a scaling project involves implementing the tested idea in an increased number of classes or schools in an efficient manner.</td>
</tr>
<tr>
<td>Translation</td>
<td>Translational Projects involve the implementation of tested ideas in new contexts. For example, a translational project could involve implementing an idea in another level and/or another subject in the same school, and/or implement it altogether in another school(s), after the idea has been successfully tested in one subject, in one level and in one school (or the effectiveness was found out through the literature).</td>
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</tbody>
</table>