

Chapter 13

Conclusion: Tenets for Cultivating Ecologies: Towards Sustaining Innovations and Self-Improving Schools



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Abstract In this concluding chapter, we take an ecological perspective and synthesise all preceding book chapters to derive three key tenets for building new contexts that emphasise synergies to diffuse and sustain educational innovations. The first tenet is concerned with calibrating top-down and bottom-up approaches and structures across the respective layers of the education ecology to create optimal conditions for diffusing innovations. The second tenet is concerned with collaborations and networks as means to build lateral connections and partnerships. Instead of competition and accountability, there is collective moral purpose to develop capacity, mentor, and collaboration between schools to co-construct innovations that benefit local contexts. The ultimate goal of networks and spreading innovative practices is to focus on sustainability and enable self-improving school systems. This leads to the third tenet, which is concerned with ecological leadership as a role that stakeholders across all levels of the education ecology could embrace to mitigate tensions and contradictions, align local needs with overall system mandates, and harness collective wisdom.

13.1 Introduction

The evolving twenty-first-century landscape entails that today's learners need knowledge, skills, and dispositions that are different from yesteryears (Brown, 2012; Jamaludin & Hung, 2016). New socio-economic demands and political shifts mean that different schooling outcomes, skills, and competencies are expected (Soffell, 2016; Teo, Deng, Lee, & Lim-Ratnam, 2013). Educational innovations, coupled with developments in technology, drive change by creating new modes of learning. These modes emphasise inquiry and student-centred practices that develop

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social-constructivist competencies such as student questioning, problem-solving, critical thinking, and other process dispositions (Brown, 2014; Hung, Jamaludin, & Toh, 2015a).

New forms of learning help education systems stay relevant. Yet, rigid demands associated with the “grammar of schooling” (Tyack & Cuban, 1995), such as subject compartmentalising, institutional routines, timetabling and exams, and risks involved, may limit educational innovations’ agility in spreading to other adopting schools. Societal expectations of schooling to achieve productive outcomes also mean that spreading educational innovations requires stakeholders to work synergistically.

Education is inherently varied and socially messy (Beach, 1999). Issues related to the scalability, transferability, and sustainability of innovations surface when integrating new practices in schools. Diffusing innovations for educational change is, therefore, a complex, non-linear process that goes beyond replication and efficiency. There is a need to focus on spreading understandings of innovations where adaptations are made for local needs and partnerships and collaborations are sought to enable diffusion (Elmore, 2016; Shirley, 2017).

Chapters in this book go beyond conceptual understandings to provide concrete examples in the form of case studies to show the dynamic interactions between stakeholders and contexts for different innovations and needs. These interactions and considerations suggest that a top-down replication approach for spreading innovations may not be as efficacious as combining top-down and bottom-up approaches (Hung, Lee, & Wu, 2015b; Lee, Hung, & Teh, 2016). The chapters illustrate the complementary and varied ways of combining top-down and bottom-up approaches depending on the innovation and level of the education ecology the innovation foregrounds. The chapters are organised based on different levels of the education ecology (chronological, systems, school, or classroom and learner subsystems) to unpack the tenets, stakeholders, and interactions of innovation and change as well as show the varied ways top-down and bottom-up approaches may complement each other.

All chapters have adopted a critical lens of innovation diffusion by using an ecological perspective (Bronfenbrenner, 1979, 1993). The ecological perspective embraces the rhizomatic nature of innovation diffusion (Jamaludin & Hung, 2016) where chapters discuss the multiple possibilities and intricacies for spreading and sustaining educational innovations from microsystem to chronological layers (see Fig. 13.1) and where new connections and nodal points for innovation diffusion may further develop and thrive. Collaborations and synergies across subsystems (e.g. system, schools, and classrooms) in the education system feature strongly for cultivating ecologies and enabling improvements. Diverse stakeholders play key roles in synergising and brokering differences within and between boundaries in the educational ecology to facilitate collective improvement and change. In this concluding chapter, we draw lessons from preceding chapters to synthesise the rationale and key tenets for building synergies and diffusing educational innovations for sustainability and self-improving schools.

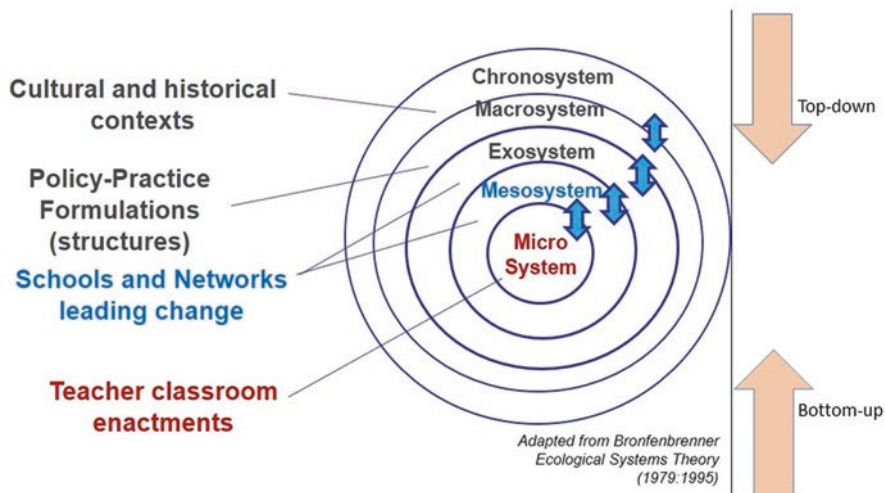


Fig. 13.1 An ecological perspective for spreading and sustaining educational innovations

13.2 Top-Down and Bottom-Up Approaches for Diffusing Innovations in an Education Ecology

Teaching and learning is a context-sensitive, sociocultural process (Bodilly, Glennan, Kerr, & Galegher, 2004; Clarke & Dede, 2009). Proponents of education reform foreground the preference for using “diffusion” rather than “scaling” to describe the complexity and dynamic nature of spreading educational innovations for change (Fullan, 2014; Garcia-Huidobro, Nannemann, Bacon, & Thompson, 2017; Hargreaves, 2012). Scholars such as Fullan (2014) and Hargreaves (2012) highlight that traditional notions of scaling connote a linear process whereby an idea is first tested in a laboratory and goes through clinical trials under different conditions before it is pushed to the mass market. This linear process raises issues for educational innovations because proponents of scaling and school reform studies recognise the importance of contextual affordances. Diffusion is preferred to emphasise recontextualisations and readaptations that integrate and spread innovative practices in education contexts. Key elements of the diffusion process include the innovation’s core principles, communication channels for transferring understandings to multiple stakeholders of the social system, and temporal dimensions (Rogers, 1995). Diffusing innovations in educational contexts values the interconnectedness between curriculum, learning resources, activities, assessment, professional development, and leadership (Looi, So, Toh, & Chen, 2011; Pea & Collins, 2008) as well as the organisational learning that results from adapting, embedding, and spreading new practices (Spillane, Gomez, & Mesler, 2009).

By adopting an ecological perspective, chapters have gleaned diverse understandings of how the influential and interacting nature of nested subsystems in the

educational ecology at the system, school, and classroom/individual layers across chronological levels has bearings on innovation diffusion. The chronological level involves temporal aspects relating to the historical developments and evolution of an education system. The system level refers to national and global trends, policies, and initiatives that impact an education system. The school level relates to school's organisational attributes such as culture, structure, and leadership practices. The classroom/individual level refers to classroom influences on the innovation, such as classroom culture, students' readiness, and teachers' pedagogies.

From an ecological perspective, diffusing educational innovations involves schools leveraging affordances and resources from the broader education system. This book has appropriated the ecological perspective to argue that both top-down (centralised) and bottom-up (decentralised) efforts work in evolving and synergistic ways to create new contexts, synergies, and impetus for diffusing educational innovations and developing the socio-technological infrastructures that sustain change. Various coupling of top-down (centralised) and bottom-up (decentralised) efforts for diffusing new practices has been articulated in the respective chapters situated at various levels of the education ecology.

Chapter 1 by Chua, Toh, He, Jamaludin, and Hung and Chap. 2 by Brown, Husbands, and Woods explicated ideas of harnessing existing approaches of education system, whether it is centralised or decentralised, to reach synergies of top-down and bottom-up approaches, against a chronological layer backdrop. These efforts enabled optimisations to be attained to create productive macro contexts for diffusing innovations within respective education ecologies.

At the system level, policies, frameworks, and communities have provided schools with directives to establish synergies that enable innovations to take root and change practices. Zohar in Chap. 3 provided insights on how top-down, system-wide professional development initiatives developed teachers' capacities for enacting policies and implementing higher-order thinking. Yet, there is a need to communicate to schools that there are spaces for bottom-up autonomy so that teachers can bridge gaps between policy and practice and ensure innovations fit local contexts. Chapter 4 by Lim, Kwan, and Poh and Chap. 5 by Shaari, Hung, and Osman acknowledged the value of communities of practice and teacher champions as drivers of innovations and change in schools. While communities and teacher champions are bottom-up drivers, their efforts could be complemented by system-level, top-down efforts to hasten and create more concerted leverages for innovation diffusion. Teo in Chap. 6 further illustrated how researchers with rich understandings of system-level policies complement bottom-up, school-based efforts to initiate and align innovations that meet policy directives as well as schools' needs. Such synergies create meaningful contexts for innovations to flourish.

At the school level, school leaders play key roles in interpreting policies, negotiating understandings with teachers, as well as creating structures and processes for a productive ecology and culture towards innovations. While school leaders have the authority to adopt a top-down approach, the chapters in this book illuminated how school leaders become critical agents of change when they recognised that teacher collaborations within and across schools are necessary to create new

ecologies for innovations and change. Spillane and Anderson in Chap. 7 illustrated the social strategies that school leaders implemented to bridge policy directives and garner teachers’ cooperation for innovations. Besides socially oriented means, Huang in Chap. 10 further described metaphors as another strategy that school leaders used to help teachers understand and rationalise the innovation diffusion approaches that schools have adopted. These metaphors embraced top-down and bottom-up approaches to spread innovations and change. Pedder and Opfer in Chap. 8 as well as Lee, Seow, and Hung in Chap. 9 highlighted the importance of foregrounding teacher capacity building in schools to sustain innovations. While the former emphasised that supportive ecologies for teacher capacity occurred when schools’ orientations to teacher learning are aligned, the latter illustrated how a school leader created structures and processes for capacity building so teachers can continue to sustain the innovation ecology and culture of spreading innovations within and across schools.

At the microsystem level, teachers and learners could create synergies across levels of the education ecology to enable innovations in classrooms and spread it to other contexts. Chapter 11 by Lim, Song, and Kho provided insights into how teachers worked with researchers to implement classroom innovations through a bottom-up approach and, subsequently, established possible synergies with top-down structures at the school district and policy levels for diffusion. Chapter 12 by Tan illuminated possibilities of how cross-contextual learning can become contexts for innovation diffusion as learners leverage learning in informal contexts to value-add learning in formal, classroom contexts.

The chapters highlight that a synergistic education ecology that couples top-down and bottom-up approaches in evolving ways is thus a viable, vibrant context for the diffusion of not just innovations but so too for innovative practices that impact desired outcomes of education. Figure 13.2 provides a summary of the key

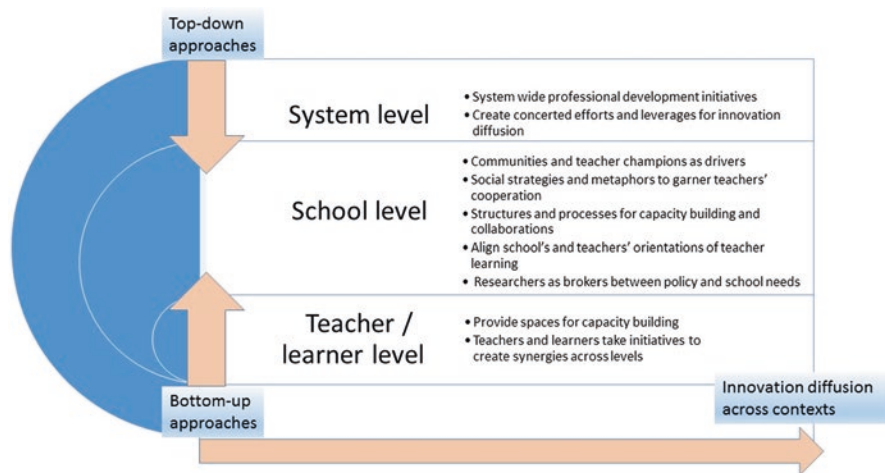


Fig. 13.2 Key aspects for coupling top-down and bottom-up approaches for diffusion

aspects and roles of stakeholders at the respective ecological layers in coupling top-down and bottom-up approaches for innovation diffusion.

13.3 Collaboration and Networks for Sustainability and Self-Improving Schools

While we have articulated the critical tenet of harnessing top-down and bottom-up approaches for *vertical* synergies across subsystems of the education ecology that can catalyse new contexts for innovation diffusion, we now highlight a second important tenet of *horizontal* synergies across the ecology which involves collaborations with stakeholders from different subsystems to cocreate value propositions and lateral connections. Literature has shown that deep change requires time, planning, and participatory efforts from entire schools and the educational ecology (Bain, 2007; Coppola, 2004; Dimmock, Kwek, & Toh, 2013). These efforts have enabled innovations to diffuse and progress from school level to system-wide changes (Harris & Chrispeels, 2006). For example, innovations at the micro-school level may not sustain if synergies are not established for continuous diffusion and transformations.

David Hargreaves (2010) elaborates that sustainable and widespread change is built on the notion of “self-improving school systems”. In such systems, schools and stakeholders take ownership and accountability of self-improvement by learning new practices through collaborating and networking with others. Schools and stakeholders with more mature understandings of innovations take up leadership roles as nodal schools. Nodal schools collaborate and network with other schools, in a horizontal synergistic fashion, to expand the reach of new practices and help other schools attain similar achievements and understandings of innovations. Thus, such collaborations and lateral connections support the diffusion of innovations as well as expand schools’ and stakeholders’ “repertoire of choices, [by] moving ideas and good practices around the system” (Stoll, 2009, p. 12) and “transcending their individual capacities” (Bain, 2007, p. 6).

Collaboration and lateral connections can be social capital drivers for diffusion built on trust, reciprocity, identity, and collective moral purpose (Hargreaves, 2012). While school networks might facilitate diffusion, the continuity of innovations requires adapting and transforming innovations to local contexts such that the initial innovation could look visibly discontinued or different (Sannino, 2010). This aligns with the ecological framing of innovations adopted in this book where diffusion and sustainability might not construe the complete adoption of initial innovations but adapt innovations to enrich local practices and needs.

Hargreaves (2010) stresses that a system of self-improving schools and partnerships is developed through three key thrusts: “professional development”, “partnership competence”, and “collaborative capital” (p. 5). Professional development refers to building teachers’ capacities to implement innovative practices across

schools. Partnership competence relates to how teachers champion and mentor other teachers within network of schools. Collaborative capital focuses on how “horizontal” collaboration across schools enables knowledge transfers and new knowledge or innovations to surface. Authors in this book have aligned with these thrusts to illustrate how top-down system supports might work in complementary ways to enable bottom-up school collaborations and networks.

For instance, Zohar in Chap. 3 described a system-wide model that emphasised professional development and the formation of communities to bridge gaps between policy and practice. Within this model, top-down structures stressed alignment to the innovation’s overall goals. However, spaces for bottom-up adaptations are also afforded where teachers, in mentorship roles, developed partnerships with colleagues to tailor professional development and change processes for local needs.

In other examples, Chap. 4 by Lim, Kwan, and Poh and Chap. 5 by Shaari, Hung, and Osman discussed how networks and collaborations as “horizontal” bottom-up constructs could be driven by “vertical” top-down supports to develop dynamism for innovation diffusion and change. Chapter 4 acknowledged the role of across school communities as vehicles to develop champion teachers who have created partnerships and collaborations that helped innovations become more widespread. The chapter elaborated on the construct of “structured informality”, to describe the role of system structures in leveraging the informality and networking capacities of communities to dialogue, build understandings, and adapt innovations’ principles to more contexts for sustained spread and change. Chapter 5 elaborated on a classification framework that characterised different educational innovations and the role of across school communities in driving diffusion at particular levels of the education ecology. The classification framework discussed the complexity of diffusing educational innovations to include dimensions such as adaptability, accessibility, and relevance of innovations. The chapter highlighted that although system-level supports are useful to drive innovations through across school communities, the dimensions that characterised innovations also shaped the extent of diffusion, whether it is at the teacher, school, or system levels.

Lateral professional development initiatives can also be initiated from a bottom-up approach. Chapter 6 by Teo has described how a researcher harnessed different schools to come together to develop capacities by codesigning and cocreating practices, structures, and processes that shaped and sustained the innovation. Interactions between the researcher and teachers ensured alignment of the innovation and professional development with the school’s and system’s directives. These interactions also enabled contextualised insights to be developed, so champion teachers could be “seeded” and “grown” within schools to mentor other teachers and generate new insights for other innovative practices.

Schools can also take initiatives to build capacities and network with other schools for spreading innovations. In Chap. 9, Lee, Seow, and Hung discussed how a school-based change journey leveraged professional development as a driver to develop teachers’ capacities to innovatively balance teacher-directed and student-centred approaches. The chapter documented how one school embarked on their own bottom-up efforts in complementary ways with its system-level mandate as a

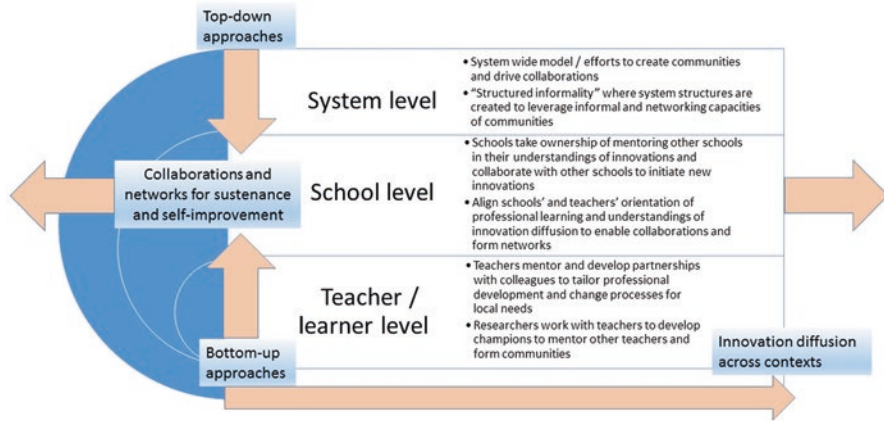


Fig. 13.3 Key aspects of collaboration and networks for self-improving schools

centre of excellence. In this manner, the school became a nodal school that took ownership of mentoring other schools within its district, guiding teachers in their understandings of innovations, as well as collaborating with these schools in initiating new innovations when opportunities arose. Pedder and Opfer in Chap. 8 further emphasised that effective professional development efforts require alignment between schools’ (top-down) and teachers’ (bottom-up) orientations of professional learning. School leaders could also help teachers understand the school’s directions for innovation diffusion through social tactics and metaphors, which are elaborated in Chaps. 7 and 9, respectively.

These important tenets of literalities and horizontal synergies enable collaborations and networks for self-improving schools that are intersecting at the various levels of the educational ecology as highlighted in Fig. 13.3.

13.4 Leadership for Synergies Across the Ecology

We have foregrounded two important tenets of top-down and bottom-up synergies and lateral collaborations and networks as catalytic contexts for diffusion and change. A third tenet is the importance of a driving force for change both “horizontally” and “vertically” within a vibrant ecology. Fullan (2004) argues that sustaining and enabling system-wide changes involves system thinkers who work beyond own spheres of influence, such as schools or national agencies, to connect to other parts of the education system. System thinkers see the education system in entirety where individual parts or subsystems cannot function in isolation without interacting with the rest (Kofman & Senge, 1995). System leaders embrace wider leadership roles to

include the success of their own schools as well as other schools (Hopkins & Higham, 2007). The role of system leadership includes leading school practices, forging partnerships with other schools, and becoming a mentor to help other schools progress. Leadership is thus a critical tenet as the driving force for change within any ecological system.

The combination of systems thinking and system leadership when situated in an ecological framing goes beyond an expansive outlook to balancing local and systemic tensions, as well as creating enabling conditions for across school improvement and innovation diffusion. An ecological-oriented leadership entails the following critical dimensions for innovation diffusion and change (Toh, Jamaludin, Hung, & Chua, 2014):

- Systems thinking to enable more schools develop collaborations and communities.
- Converge and contextualise innovations between local needs, vision, and overarching system mandates.
- Align efforts to address tensions and contradictions within and across multiple levels of the education ecology.
- Leverage collective wisdom, resources, and enablers across different levels of the educational ecology for diffusing innovations.
- Emergence of new capacities for adapting, spreading, and sustaining innovations.

The premise of ecological leadership aligns with the ecological view foregrounded in this book where synergies between top-down (centralised, formal) and bottom-up (decentralised, informal) approaches as well as structures that are carefully calibrated across subsystems to enable optimal results for innovation diffusion (Chua, Hatch, & Faughey, 2014). Ecological leadership is different from distributed leadership and system leadership. Distributed leadership includes the collaboration of multiple leaders working together, but it usually focuses within particular level of the ecology, a school, rather than across levels (Hallinger & Heck, 2009; Harris & Spillane, 2008). System leadership focuses on leaders within their own schools or sphere of influence while remaining mindful of the bigger picture (Fullan, 2004). Ecological leadership goes beyond distributed and system leadership to create synergies by rebalancing the dialectics of across school competition to focus on collaboration and networking for developing self-improving school systems. Collaborations and networks are built on dynamic and reciprocal relationships where schools work together in calibrated ways to achieve collective moral good (Hargreaves, 2012) and optimise the education ecology's performance as a whole for innovation and change.

Chapters in this book have elaborated efforts by education systems that considered the system's historical developments from a chronological perspective where attempts are made to create a "balanced" context for ecological leadership. For instance, Chap. 1 by Chua, Toh, He, Jamaludin, and Hung foregrounded the concept of centralised-decentralisation which created a backdrop for developing ecological leadership as a way of thinking for all stakeholders situated across subsystems of the Singapore education ecology. Similarly, Chap. 2 by Brown, Husbands, and

Woods elaborated on how a decentralised education context, such as the United Kingdom, created synergies with top-down efforts and funding to nurture teachers' leadership capacities to align innovations between schools' and systems' needs for sustained district transformations.

Palpably, the concept of ecological leadership shifts away from positional leaders to leadership that can be distributed to collective voices stemming from stakeholders at various layers of the education ecology. By listening to and consolidating the voices of diverse stakeholders, the ecological leader works in aligning and converging different subsystems of the education ecology as well as mitigating tensions and paradoxes when diffusing innovations within and across schools (Toh et al., 2014). Thus, ecological leadership is not just a construct that resides in key leaders or individuals in the education ecology. Rather, dimensions of ecological leadership can be embraced by the collective capacities of multiple stakeholders across different subsystems of the ecology.

These ideas of ecological leadership when appropriated to chapters in this book suggest that ecological leadership could be embraced by stakeholders in all levels of the ecology as long as they are cognisant of the dimensions of ecological leadership and seek synergies within and across schools for innovation diffusion and progressive improvements. At the systems level of the ecology, stakeholders from the ministry or national agencies may develop top-down structures to facilitate and enable bottom-up initiatives to surface in complementary ways. Chapters 3, 4, 5 and 6 have elaborated on how stakeholders at the system level developed integrated professional development and communities of teacher champions which enabled the spreading of innovations across schools. These collaborations and networks created collective understandings of innovations that fit school and policy mandates to spread existing and new innovations. At the school level of the ecology, Chaps. 7, 8, 9 and 10 have demonstrated how school leaders engaged in ecological leadership by using different social tactics, metaphors, structures, and processes to converge schools' and teachers' understandings of innovations and capacity building efforts. These efforts addressed tensions and contradictions so innovations could diffuse beyond schools. At the classroom and individual level of the ecology, teachers and learners in Chaps. 12 and 13 have shown examples of how they made innovations meaningful for their own contexts, as well as adapted it to ensure coherences across other levels of the education ecology so that innovations can be transferred to benefit other contexts. In essence, ecological leadership may be enacted at different levels of the education ecology where the interactions and outcomes at different levels of the education ecology contribute towards collaborations and networks in calibrated and synergistic ways for innovation diffusion and sustainability. Fig. 13.4 provides an illustrative summary of the key dimensions of ecological leadership as articulated and exemplified in the respective chapters of this book.

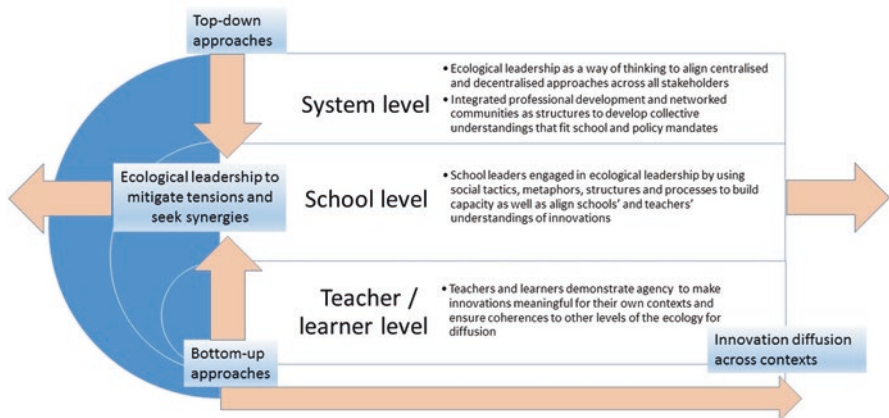


Fig. 13.4 Key dimensions of ecological leadership for synergies across the ecology

13.5 Conclusion

In this concluding chapter, we have taken an ecological perspective and synthesised all preceding book chapters to derive three key tenets for building new contexts that emphasise synergies to diffuse and sustain educational innovations. The first tenet is concerned with calibrating top-down and bottom-up approaches and structures across the respective layers of the education ecology to create optimal conditions for diffusing innovations. The second tenet is concerned with collaborations and networks as means to build lateral connections and partnerships. Instead of competition and accountability, there is collective moral purpose to develop capacity, mentor, and collaboration between schools to co-construct innovations that benefit local contexts. The ultimate goal of networks and spreading innovative practices is to focus on sustainability and enable self-improving school systems. This leads to the third tenet, which is concerned with ecological leadership as a role that stakeholders across all levels of the education ecology could embrace to mitigate tensions and contradictions, align local needs with overall system mandates, and harness collective wisdom. Ecological leaders, therefore, need to create enablers that thrust innovation diffusion and grow capacities to initiate and adopt new innovations so that the ecology continuously evolves.

It is hoped that through the collection of chapters presented in this book, the authors have provided insights into the synergies and calibrations that could be sought where layers of the education ecology come together to create productive contexts for innovations diffusion. We also hope that the detailed case studies exemplify nuances and pathways for the operationalisation and implementation of innovations for change that could be experimented in readers' respective educational contexts. We recognise that every system is complex and that the starting points for educational change and the diffusion process for innovations may be contextually different. We posit that critical tenets of horizontal and vertical synergies enabled by

driving forces of change instantiated through ecological leadership remain resonant as the crux for change to occur. Admittedly, these changes will not be smooth, setbacks may occur, and hurdles may be presented, for example, through rigid adherence to traditional tried and tested pedagogies or fervent teaching to the high-stakes tests. Yet, if we want to focus on energising and empowering stakeholders at the respective layers of the ecology, we need to remain cognisant of the need for horizontal and vertical synergies as well as ecological orientations to leading change. It is hoped that these synergies and orientations enable the incremental pathways that lead us to the desired peaks of excellence inherent in every system.

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