

# Promoting teachers' instructional practices in alternative assessment through teacher collaboration

Lyna<sup>1</sup>  · David Wei Loong Hung<sup>1</sup> · Sau Kew Chong<sup>1</sup>

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**Abstract** This paper reports the findings of a study which aims to examine the processes and effectiveness of the collaboration between teachers in their professional learning which some Singapore schools are currently engaged in. The learning process attempted to raise the profile of teacher professionalism in classroom alternative assessment through action research. A total of nine schools participated in this two-year study. Participants included teachers and school leaders. Guided by a university researcher and supported by a cluster superintendent and school leaders, the collaboration helped familiarise teachers with alternative ways of assessing student learning, connect theories with practice in their classroom assessment, and acquire the skills of doing research. Facilitated by a structure that supports the development of partnerships between teachers from different schools, the collaboration focused on teachers working on a common task. The data reveal how teachers took ownership of their own learning through this process and led their peers in their respective schools in curriculum customisation through alternative assessment practices. Such an education reform process, which has driven the effectiveness of the collaborative teacher learning in promoting teachers' instructional practices, is analysed from four dimensions, namely, (a) macro level (systemic reform), (b) school level (school improvement plans), (c) teacher level (teacher community), and (d) micro level (classroom level). This paper concludes with a discussion of the challenges in sustaining teacher collaboration across schools in Singapore.

**Keywords** Teacher collaboration · Partnerships between schools and university · Classroom alternative assessment · Education reform

## 1 Introduction

Assessment plays a central role in education. Designing assessment tasks that are authentic as well as intellectually challenging can improve student learning and performance. That

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✉ Lyna  
lyna@nie.edu.sg; lyna.kwan@gmail.com

<sup>1</sup> National Institute of Education – Nanyang Technological University, 1 Nanyang Walk, Singapore 637616, Singapore

is, if teachers set more intellectually demanding tasks, students are more likely to generate better quality work or artifacts (Koh and Luke 2009). While the creation and validation of assessments and their alignment with classroom instruction is of high demand (McMillan 2003), the challenges to curriculum are complex and manifold, and are commonly associated with teachers' epistemologies in conducting classroom assessment. Teachers' tendency to teach to tests in order to prepare their students to do well in high-stakes tests, their emphasis on teaching what is tested, and their obligation to adapt curriculum and teaching accordingly (Anderson 2012) often impede the implementation of classroom assessments that are deemed as authentic. In the case of Singapore, preparing students for high-stakes examinations (Koh and Luke 2009; Tan 2013) typifies classroom assessments.

It is worth noting that schools in Singapore were previously ranked based on the grades that their students achieved at the national and international examinations, and that these rankings were made public. Although rankings and the league tables systems have been removed, the competitive atmosphere of getting the 'best' scores remains. The use of students' aggregate score for all examined subjects at national examination for determining students' eligibility for admission into his or her school of choice (Tan 2013) has led parents and other key stakeholders in education to shun schools that have little direct benefits for students' entrance to university or winning a scholarship (Tan 2008). Nevertheless, there are growing perceptions that students should be equipped with deep learning and good communication skills (Binkley et al. 2012) when they leave school, an expectation that has similarly been emphasised by the state's Ministry of Education (MOE) in recent years (Singapore Ministry of Education 2015).

In regard to the state's concern about students' learning, there is a growing desire among some teachers to shift assessment practices from a conservative conception where alternative assessment is perceived as a supplement to the existing practices to a progressive one with alternative assessment being viewed as an indictment of current practices (Tan 2013). In order to nurture teachers' assessment literacy, the superintendent of a school cluster in Singapore believes that teachers should be given adequate opportunities to collaborate within and across schools toward this goal. This involves equipping teachers with the knowledge and practices of conducting classroom assessments to address the learning needs of their students and to examine the effectiveness of such practices through action research (Loh 2012).

The two-year study on which this paper is based examines how the collaborative teacher learning process, guided by a university researcher and supported by a cluster superintendent and school leaders, can enhance instructional practices in classroom assessment of in-service primary and secondary schools teachers in Singapore. While there are many studies on collaborative teacher learning which have been conducted in many decentralised educational systems such as the United Kingdom (UK), New Zealand, the United States (US), and the Netherlands (Cummings et al. 2008; Hill et al. 2006; Muijs 2007; Van Veen et al. 2005), less attention has been devoted to the study of teacher collaboration across schools to promote teachers' professional learning in hierarchical and centralised educational systems. In contrast to the phenomena observed above, the education system in Singapore provides policy makers with the space to plan and design initiatives to shape the school curriculum. Such a space is based on the belief that the people who enact the policies have the autonomy as well as the understanding to do what they construe as sensible. Hence, the case of teacher collaboration in Singapore attempts to demonstrate the axiom of top-down support for bottom-up initiatives (Hung et al. 2012). This paper documents how the top-down support was given by the cluster superintendent for a cluster of schools in Singapore and how the school leaders involved created a structure that enabled collaborative learning among teachers. This account will be examined by the following two research questions:

- (1) What kinds of structural (designed) supports enabled collaborative learning of teachers across a cluster of schools?
- (2) What are the successes and challenges of teacher collaboration in enhancing teachers' instructional practices in classroom alternative assessment?

## 2 Teacher collaboration

The idea of learning from interacting with practitioner communities is rooted in the theories of social learning and cognitive apprenticeship (Vygotsky 1987). The view of community as a resource for learners where they can participate and learn alongside experts to develop themselves personally and professionally was later developed by educational proponents such as Lave and Wenger (1991), who coined the term Community of Practice (CoP).

Similarly, McMahon (1997) elaborates that learning is neither a process that takes place only inside our minds nor is it a passive development of our behaviors shaped by external forces. Instead, he argues that meaningful learning occurs when individuals are engaged with social activities from which relationships are formed through interacting with others. Thus, knowledge is a product that is socially and culturally constructed from learning which is rooted in both the individual and social-others and which puts thinking and sharing at the core of learning (Dewey and Bentley 1949/1991). Such an active engagement enables learners to develop contextualised knowledge and identity (Wenger 1998) as well as professionalism (Hargreaves 2000; Hargreaves and Fullan 1998).

Based on empirical studies in education, teacher collaboration has been noted as an effective approach in meeting educational goals, such as pooling resources and sharing teaching practices in the contexts most relevant to the members (Harris et al. 2006; Muijs et al. 2010) and increasing school capacity (Chapman and Allen 2005). The collaboration also yields influence gathering within or across schools, which occurs when a cluster of persons exerts more influence than what the individual could do alone (Lin 1999). Studies have shown that collaboration works when there is trust facilitated by prior relationships (Muijs et al. 2006), clear contractual arrangements (Lindsay et al. 2005), and goals that are shared by members (Muijs 2008; Sydow 2000), and explicit management structure such as distributed leadership (Muijs 2006; Muijs et al. 2010) to support teachers' instructional practices. Collaboration fails when there is no time provided for collaborative activities, no clear wins for all partners, lack of shared perspectives and understanding, lack of internal capacity in schools, and lack of clear goals (Muijs et al. 2011). In this paper, the term 'collaboration' or 'partnerships' will be appropriated synonymously.

Drawing on the work that has been done on teacher collaboration, our study examines how teacher collaboration can support professional learning of teachers in Singapore. By 'teacher collaboration,' we mean teachers within and across schools working toward understanding and sharing of resources and experiences. This conception enhances both implicit and explicit knowledge about classroom alternative assessments through the methodology of action research, as practised by teachers.

## 3 Methodology

### 3.1 Context and participants

The collaborative teacher learning partnership was a project initiated by a cluster superintendent where five schools with four to nine teachers per school came together, shared a concern,

and deepened their knowledge in classroom alternative assessment by interacting with peers within and across schools. The main purpose of the collaboration was to promote teacher professionalism. The collaboration, which lasted one year, consisted of teachers and school leaders (principals and vice-principals) from primary and secondary schools. The teachers taught Science, Mathematics, English, or Social Studies in their respective schools. In order to evaluate the effectiveness of the alternative assessment which teachers implemented in their classrooms, it was mandatory that each participating school conducted action research which was guided by a university researcher.

The participants of this two-year study (from February 2012 to December 2013) were 29 teachers and five school principals from five schools in each respective year. Each of the five schools sent four to nine representative teachers from Science, Mathematics, English, or Social Studies department—either one head of subject or one vice principal who served as the school team leader, one senior teacher, and two to seven other teachers—as well as the school principal to learn together as a community on a yearly basis.

In 2012, the five schools consisted of three primary schools and two secondary schools while in 2013, two primary schools and three secondary schools participated. The participating schools were totally different each year, except for one secondary school who took part in the collaborative learning for two consecutive years. A university researcher, acted as an external consultant, worked closely with the schools and with a school principal from another school (outside the five participating schools) who acted as a facilitator in the teachers' collaborative learning on a yearly basis. The consultant focused on the content knowledge of classroom alternative assessment and the ways of conducting action research, while the facilitator (school principal) attended to the dynamics of the partnership and ensured the existence of the spirit of community and collegiality throughout the one-year learning journey. For instance, the school principal encouraged the discussion within and across schools on the challenges in implementing alternative assessment which were encountered by the schools.

It was mandatory that participating teachers from each school attended the launch event of the collaborative learning at the beginning of the year, six three-hour consultancy sessions throughout the year, and a mini-learning symposium in September. The mini-learning symposium was an annual event every September. The purpose of this event was to promote learning among the participating teachers through their sharing of the enactments of their classroom alternative assessment and the progress made in the classroom action research. Due to their workload at school, the school principals of the participating schools attended at least one of the six consultancy sessions and the mini-learning symposium. By end of the year, each participating school had to submit an action research report vetted by the consultant (the university researcher). In addition to the action research report, a team reflection from each participating school had to be submitted to the steering committee of the forum. The steering committee was a joint collaborative committee between the MOE and the school principals. The action research reports and written reflections were then scrutinised further by the steering committee before being published in an annual publication which serves as a reference for both MOE and schools. The structure as set up by the superintendent and school leaders is likened to a CoP, although not in the purist sense as espoused by Wenger (1998). The crux of our study relating to structure is whether nudging by school leaders at both school and cluster levels can propel teachers toward a more willing stance in collaborative efforts despite a heavy teaching load and an ingrained and long-standing assessment regimen.

### 3.2 Data collection and analysis

We adopted the qualitative research paradigm where extensive observations, interviews, and document analyses formed the basis of our data collection and analysis efforts. As participant observers, every year we participated in the launch event in the beginning of the year, six three-hour consultancy sessions throughout the year, and the mini-learning symposium in September. We also administered and analysed teacher questionnaires before the first consultancy session started in order to understand teachers' conceptions of alternative assessment, their challenges, and their existing assessment skills. The questionnaire was adapted from Ogan-Bekiroglu's (2009) work. (See Appendix 1 for some sample items of the questionnaires.) During the consultancy sessions and mini-learning symposia, we observed interactions among all the participants, audio-taped all group discussions, and took field notes. We collected and scrutinised the progress and final action research reports from each school. We also analysed the teachers' reflections published in the annual publications, semi-structured interviews, and informal discussions with the teachers and school leaders. The data were triangulated with one another to substantiate their reliability. We analysed the data qualitatively using open coding (Saldaña 2013) through which codes, categories, and themes emerged naturally from the data. The coding process began with open coding of passages from the interviews and of the documents, then comparisons were made between the different sources to identify possible themes among the codes. Finally, we looked for patterns among the themes to find any relationships among the codes and teacher practices.

The process of data collection and analysis was reiterative. We discussed the data collected and analysed during weekly meetings. The data were also shared and discussed with research participants. In this way, we sought to improve the credibility of our interpretation and conclusion.

## 4 Findings

Through the analyses of the teacher questionnaires, informal discussions, interviews, observations, field notes, progress and final action research reports, and written reflections from each school, three major themes emerged. With guidance from a university researcher and supported by a cluster superintendent and school leaders, the collaborative learning helped teachers become familiar with alternatives to traditional measurements of student learning, catalysing for change in pedagogy and classroom culture. The teachers were able to connect theories with practice, and acquired the skills of doing research through conducting classroom action research at the school level. Furthermore, interview data from teachers and school principal revealed that teachers took ownership of their own learning and had led their peers in their respective schools in curriculum customisation through alternative assessment practices and action research.

### 4.1 Alternative assessment as a catalyst to classroom pedagogical reform

While studies emphasize the importance of using varied assessment strategies at various times in order to produce valid inferences about what a student knows or understands (Stiggins 1995), our analysis of the teacher questionnaires which were administered before the first consultancy session started every year reveals that "examinations composed of common national exams (PSLE/O-Level Exams) questions" was the most favorite assessment

method for all participating teachers. Almost all of the teachers seldom used portfolios, progress interviews, role plays, and debates to assess students' learning. This was in line with findings from studies conducted by [Anderson \(2012\)](#) and [Ogan-Bekiroglu \(2009\)](#).

The collaborative teacher learning helped teachers become familiarised with the alternatives to traditional measurements of student learning. A school leader said,

Some important takeaways for us in this learning journey were the focused sharing of various kinds of alternative assessments implemented in the participating schools, how teachers could use alternative assessment to change the culture of their classrooms, help students to feel safe to take risks and to develop self-confidence in the classrooms. We also learnt that to meet a range of student needs, we need to vary instruction and assessment methods to assess student understanding [S1–12].

To change the culture of classrooms, some of the teachers who practised alternative assessments had to also reform their pedagogical practices in the classrooms from predominately didactic to inquiry based where student's voices, ideas, and questions were encouraged. Such a reform process was not easily sustainable as curriculum and lessons had to be redesigned in the light of the alternative assessments. In some of our observations across schools in Singapore, teachers got together informally to peer-observe each other's lessons and provided critique on the processes of inquiry and assessment.

Many studies show that well-developed rubrics help students understand and internalise the performance or success criteria, which leads to improved learning and higher quality of work or better performance ([Chappuis et al. 2012](#)). It provides rich information of the extent to which the specified criteria have been achieved by individual learners. It also serves as a powerful tool for teachers to communicate and clarify the targets of instruction (i.e., what teachers want students to know and be able to do) and to track student progress toward the targets. While well-developed rubrics are key elements in teaching and learning, we found that the most common difficulties encountered by the teachers in this study, as revealed through the teachers' questionnaires and informal discussions, were the preparation of scoring rubrics and asking high-level questions. Nevertheless, having gone through the one-year learning journey in the collaborative learning process, the teachers were gradually transformed, as reflected on the following excerpts:

This is our first attempt at designing a Mathematical Modelling task as alternative assessment. We believed in designing an authentic task that makes learning Mathematics more meaningful to students. The team is now more confident in conducting alternative assessment, drafting rubrics and analysis of both quantitative and qualitative data. In the few months together, we were exposed to a range of assessment which we were able to share with the teachers in our school. Our department has been drafting rubrics for assessing students' work for past projects, but this is the first time that we felt that the students knew the expectations clearly and were using the rubrics conscientiously as a form of self-assessment. [S7–13]

In other words, the collaborative learning endeavors enabled the teachers to delve more deeply into the student learning issues and to draw linkages between the rubrics and the learning outcomes beyond the conventional assessment. It appears that the mentoring provided by the university researcher and the peer dialogs enabled this deepening of learning.

## 4.2 Theory and practice nexus in instructional practice can be achieved through the process of action research

Although the teachers have not yet reached the level of conducting rigorous action research, with guidance from the university researcher who acted as the consultant, the teachers were able to at least connect theories with practice in their classroom assessment while developing their research competence. For example, in a school's project on using mathematics journals as formative assessment to enhance students' understanding of squares and rectangles, the teachers were able to connect the two—theories and practice—as what they wrote on their action research report below:

A number of studies (e.g. Chai 2004; Kostos and Shin 2010) have suggested the use of journal writing to develop and help students demonstrate the methods (processes). Furthermore, Connolly (1989) claims that ... In the same vein, Hopkins (1997) reinforced that ... Along similar lines, Jurdak and Abu Zein (1998) concluded in their study that ... Journaling should be used consistently over time to achieve results in writing and learning (Schultz 2009, p. 9). Based on the literature review as discussed above, we decided to design journal writing prompts and tasks that allowed pupils to demonstrate their understanding of the mathematical concepts learnt... [S9–13]

Our justification is also supported by an example of a teacher's statement below:

We learnt to question our own practices, pick up useful threads from literature review and weave them in our own classrooms. [S1–13]

It is in the integration of theoretical principles they learned and enactment of practice that the teachers developed insights in their understandings and uncovered nuances in understanding 'beyond the textbooks.' From such enactments, teachers had the experiential knowledge to bring forth comments and critiques when they engaged in the consultancy sessions.

As practitioners, teachers typically struggle to connect theories with practice which should work hand in hand, where one depends on and affects the other. However, our data suggest that the collaborative learning designed has provided a reasonable structure for the meaning-making and social constructivist process.

## 4.3 Ownership of learning fostered through collaboration

Having learned and conducted classroom action research, the teachers were gradually becoming confident in their ability to take ownership of their own learning. Below is an example of their statements:

...We also took greater ownership over our teaching and discovered what works best in our own classrooms by identifying specific classroom problems, targeting causes through systematic data analysis and applying effective solutions to the existing problems. [S1–13]

Furthermore, the teachers led their peers in their schools in curriculum customisation through alternative assessment practices and action research. A school team leader articulated it well:

We are proud to say that this project [the collaborative teacher learning] has successfully engaged us and we see ourselves leading our teachers in innovative approaches, engaging our teachers to be academically pertinent, and inspiring our pupils as well as the



school community and educational fraternity, at large, towards innovative-improvement and the passion for continued pursuit in learning. [S3–12]

With substantive mentoring by the university researcher and the peer support rendered by the group, the teachers were observed to return to their respective schools and engaged in influencing others in their respective schools. Peer-mentoring positions teachers as those with valuable resources to lead and share (cf. [Cuddapah and Clayton 2011](#)). This is evidence that these teachers have begun to have a belief that alternative assessment does work in the local context and that their students benefit from such practice. This form of ownership was also observed when the same teachers discovered a certain need or deficiency in their own teaching. They pointed out that students could understand better when a different assessment approach was adopted.

Furthermore, the professional learning opportunities in such situations have a sustainable impact on the teachers' practices, as stated by a school principal:

... being part of it [the collaborative teacher learning] has served to build the science teachers' capacity in the pedagogy with the help of the consultant. In turn, these teachers are able to lead another teacher group in the school in the following year. [S5–12]

#### 4.4 Differing expertise contributes to collaborative partnerships

Over the past two decades, many studies have reported positive effects of teacher collaboration on cognitive, affective, and social domains (e.g., [Fwu and Wang 2012](#); [Muijs et al. 2010](#)). As perceived by the teachers, the collaborative learning has provided teachers a platform to enhance their professionalism.

The teachers in our study also found it heartening to work closely with the university researcher. The interactions, discussion, and guidance from the university researcher have helped the teachers improve their professional learning in classroom assessment and action research, as acknowledged by the teachers:

... the monthly consultation sessions with our consultant definitely enriched our knowledge towards Action Research. Her invaluable feedback and guidance helped us to refine our research processes and ask thought-provoking questions. The discussions were certainly very enriching and enlightening as the exchange of ideas and critiques enabled us to make any necessary adjustments to our research project. [S4–12]

The capability of the consultant in sharing knowledge and providing timely feedback also played a crucial role in propelling the collaborative learning, as expressed by the teachers below:

Thankfully, our consultant was very patient in explaining to us different ways of analysing the data. She presented us multiple angles when reading the same set of data... We are also very grateful to her for being so dedicated to educational research, so meticulous, and so prompt in replying our queries. [S7–13]

While this theme is not new according to literature, forming partnerships among individuals with different expertises is still nascent as far as teacher learning is concerned in Singapore schools where the professional development is situated in real authentic task contexts. It is critical that facilitators of the learning groups create an open culture for teacher discourse and at the same time develop mentoring abilities to equip teachers with the desired skills sets to achieve the desired learning outcomes.



#### 4.5 Structuring the designs for collaborative learning

In general, conceptualisations of teacher collaboration, including Wenger's (1998) CoP, essentially foreground the "loose" structure. However, based on our observations, the collaboration did not occur automatically. The relatively "tight" or intentionally designed structure might be initially perceived as coercing for collaboration, but when the teachers were able to see the "value add" in coming together to improve student learning, they began to be more willing and over time might even become productive contributors. It is evident from the teachers' statements below:

... Also, learning has been structured and planned. Each session was carefully designed to ensure that there was a gradual progression in the various stages of Action Research. Hence, our team was able to implement our project in a systematic and organised manner. Such a structured learning process gave us ample time to examine our research processes and hone our action research skills. [S4–12]

The meetings that were scheduled for all participating schools were well spaced out and structured. It provided us with a timeframe to guide us in the planning and implementation of the project... The structure that was put in place by our Zonal Leader enabled us to plan the schedule of the various stages of implementation and finally, the completion of our project. [S9–13]

From our interviews with teachers, we recognise that formal structures do not necessarily lead to autonomy and agency for learning on the part of the teachers. However, if this phenomenon is complemented with the encouragement to accommodate teachers' learning needs, their willingness to participate actively in collaborative learning can occur over time. With appropriate structural supports such as time given to participate in the teacher collaboration and recognition from school leaders for their contributions, such nudging intentionalities can foster deeper learning of a particular instructional practice among teachers from various schools. Other examples of structural supports include presenting their work at annual conferences and showcasing their lesson designs and assessment packages at suitable platforms such as their school-based professional learning communities (PLCs) and school cluster learning symposium.

Hence, while the idea of a relatively "tight" structure might be in conflict with the characteristic of Wenger's CoP as typically defined by literature, it can potentially serve as an initial nudging structure. It is a coupling of "top-down" nudging and support and the "bottom-up" construction of teacher learning.

While Hung et al. (2005) have noted, "The Singapore school culture does not fundamentally possess a constructivist-sharing and dialoguing epistemology" (p. 167), our data from this study have pointed to the possibility of structures reforming teacher discourses significantly toward a social constructivist epistemology if they are designed well.

### 5 Discussion

Changing assessment practices can influence reforms in classrooms and schools. To spur teachers toward these reforms, the strategy of teacher collaborations and partnerships was mooted by the cluster of schools we studied. In order to address the gap between the outcomes produced by any conventional schooling system and the new 21st century learning expectations, teachers are to be professionally developed in ways that enable them to educate

students with the desired outcomes. However, teachers are known to be very busy and classroom practices are notoriously known to be very difficult to change. With these intents, a cluster superintendent initiated the collaborative teacher learning for teachers to collectively and collaboratively nurture ideas, improve practices, and promote teachers' professional learning and mastery through classroom action research to improve students' learning.

Changing standard practice is often a daunting task. School culture which highly emphasises assessment for *accountability* may impede teachers' practices of alternative assessment although the teachers may value it. Besides, the ideal collaborative fellowships are hard to achieve in the Singapore context since schools compete against one another through the projects and activities they participate in (Tan 2008). While the provision of appropriate credit, incentives, and rewards for sharing expertise or mentoring beginning teachers through teacher community is promoted (Kim et al. 2007), the intense competition that arises from the ways in which teachers are appraised may hinder teachers attempts to collaborate.

'Competitive environment' is relative to 'collaborative environment,' and may compromise the depth and scope of the knowledge sharing in learning communities. The teacher collaboration approach as examined in this study is expected to gradually reduce the level of competition among schools and among teachers, and create opportunities for schools and teachers to harmoniously collaborate toward larger schools' visions.

Findings from this two-year study suggest that the collaborative teacher learning created a structure for teachers to grow professionally as they experienced the spirit of community and collegiality throughout their learning journey toward curriculum customisation. Teachers gradually valued collaborative learning as one promising way to collectively improve their instructional practices in order to meet students' need.

Although the notion of collaboration has successfully created a platform that enabled teachers to develop contextualised knowledge and identity through their active engagement, there are some limitations. The life cycle of the collaboration was too short, which was only one year because of the "graduation" mechanism where the teachers were encouraged to initiate their own collaborative learning among their peers in their respective schools after the one-year learning journey. While Wenger (1998) argues that the (teachers') experience and competence are 'fertile' ground for learning, and the two must remain in tension so that the learning and practice within the learning community can evolve, this phenomena might never happen in the collaborative teacher learning forum because of its short life cycle. The prospect of how teachers who have "graduated" from the collaborative learning and returning to the same platform to serve the following year's new batch of participants opens up possibilities for further studies to sustain the learning community.

With regard to the implementation of classroom action research in alternative assessment, our analysis suggests that the teachers struggled to serve both assessment for *accountability* and assessment for *continuous improvement*. Although the focus of the action research was more on the coherent and comprehensive assessment system, the teachers tended to concentrate on helping their students acquire specific content (high-stakes tests oriented) rather than helping them build process skills through the assessment. Therefore, it would be important for future research to further investigate how to facilitate teachers to serve both assessment for *accountability* and assessment for *continuous improvement*. Understanding school cultures as well as teachers' belief in assessment and their practices of it could be a significant step to take the going forward.

Finally, although there has been a growing desire to infuse the spirit of teacher collaboration into schools in Singapore over the years (Hung et al. 2005, 2006), creating a sustainable collaboration across schools is still a challenge. Balancing a highly competitive (Tan 2008) culture with a collaborative one is a continuous pursuit, and finding the balance is necessary.

Schools should also develop cultures for learning where competition-and-collaboration can co-exist.

Our research points the way to more studies on how teacher collaboration can be structured in “tight-loose” designs that enable teachers to cultivate opportunities to continuously and harmoniously collaborate and learn together with their peers within and across schools. One way is by having clear management structures (Muijs 2006; Muijs et al. 2010) while at the same time managing power imbalances among different groups (Egodawatte et al. 2011). For example, cluster superintendents and school leaders can provide the “tight” designs or infrastructures that support teachers' efforts in enacting the school curriculum through the alignment of authentic tasks with their school's goals. Teachers, on the other hand, can work on the “loose” designs or fostering the lateral networks of informal interactions among teachers across schools with respect to the search for alternative ways of assessing student learning, as in the case under study. Through teacher participation in the teacher collaboration efforts, teacher leaders can be identified by the cluster superintendents. School leaders such as school principals can serve as resource persons which schools across the groups can consult and seek for advice in their subsequent efforts in implementing alternative assessment in their respective schools. Such efforts might subsequently lead to greater “loose” laterality as teachers here might prefer to engage with teacher leaders on pedagogical and curricular matters rather than with school leaders.

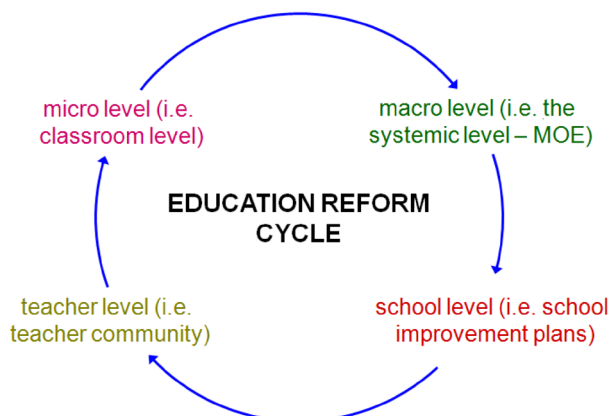
This study may also be helpful for educators and/or policy makers who are searching for a breakthrough to actualise reform activities at the macro level (i.e., systemic reform), school level (i.e., school improvement plans), teacher level (i.e., teacher community), and micro level (i.e., classroom level). It offers insight into the effectiveness of teacher collaboration which serves as one promising way for accomplishing the necessary transformation and reformation of education system in Singapore as well as abroad.

## 6 Implications for reform in education

In order to address the 21st century challenges through classroom alternative assessment and to drive the effectiveness of the collaborative learning, we conceptualise a cycle for any educational reform (see Fig. 1).

We unpack each of the four dimensions, namely, macro (systemic) level, school level, teacher level, and micro (classroom) level, in the following.

**Fig. 1** Education reform cycle



## 6.1 Macro level: systemic reform

To prepare students to become a member of the knowledge-driven society and the 21st century multi-literate citizen, schools must be transformed in ways that will enable students to be successful in work and life (Binkley et al. 2012). This underscores the importance of providing students with skills that are relevant for the economy. As Gopinathan (2007) has argued, all reforms need to place an emphasis on equipping students with the appropriate processing and higher-order thinking skills, and the competence to utilise technology in learning. Making some changes to assessment and allowing teachers to participate in this assessment change through their interactions within and across schools are ways that the education system can do to create such spaces for learning.

In accordance with the assessment reform in educational practice, MOE has made a strong commitment to fostering 21st century competencies among Singapore students. To incorporate 21st century competencies in academic curricula, Singapore schools continuously refine their curriculum, teaching approaches, and assessment methods (Singapore Ministry of Education 2010a). Policy in Singapore such as the Teach Less, Learn More is one such attempt to encourage the move away from the examination-driven teaching to a more authentic way of learning (Singapore Ministry of Education 2009, 2010b, 2015). As far as centralization (tight) policies are concerned, they should send the appropriate signals to the schools to nudge them toward reform practices. These policies should also encourage schools and teachers to align themselves with the desired policy intents. Moreover policy directives should also provide resources such as sending MOE specialists to schools to support teachers' pedagogical content knowledge or university researchers to clusters to help teachers see the link between policy and practice.

## 6.2 School level: school improvement plans

In order to make learning meaningful and purposeful, the Alternative Assessment action research represented work at the level of the school, not at that of the individual teacher. That is, the classroom action research conducted must have school-wide interests and needs.

On top of it, in the same vein as that reported in other studies conducted abroad (e.g., Muijs et al. 2010), we observed that support from school principals throughout the collaborative learning journey was very crucial. Such support was manifested even if the principal was not able to attend the consultancy sessions. In our study, the school principal created structures to allow teachers to participate actively in collaborative learning by blocking off specific time in timetables for the teachers to work on their action research project. This approach not only enabled teachers to see the balance between their professional learning and their accountabilities, but it also allowed them to experiment the teaching practices gained from their collaborative learning where in some cases, could be opportunities for 'failures-in-learning.' This resonates with Tan's (2008) observation that innovation requires a culture of risk-taking and experimentation instead of complying with rules and avoiding the occurrence of failures. Given such a support from their school leaders, teachers might begin to see the need for change in their moment-by-moment participation and practice in schools, and their reflections of their professional learning experiences. Such leadership was fundamental to the success of the teacher learning. In short, the collaborative teacher learning was also a good platform for school leaders to work together with their teachers as a school team on common curriculum customisation to suit the needs of their students.

Hence, in this case, the collaborative learning appears to be a form of complementary partnership between macro- and school- levels where the agendas of both parties are present. The platform aligns both the macro- and school- levels of mutual engagements.

### 6.3 Teacher level: teacher community

Teacher community plays a significant role in education reform. [Hargreaves \(2003\)](#) states it clearly, "... at the heart of educational transformation are networks of communities of teachers who are passionate about transferred innovation." (p. 18).

The collaborative learning started as a group motivated by the notion that personal mastery through action research was a key to becoming an effective teacher ([Capobianco and Feldman 2006](#)). One of the stated goals of the collaboration was to develop teachers' instructional practice and mastery, and to equip the teachers and school leaders to anticipate and lead change ([Loh 2012](#)). In order to achieve the goals, the mandate of the collaboration was to encourage the teachers, and in the spirit of community and collegiality, to learn from each other as well as to cross-fertilise new ideas guided by a university researcher and supported by a cluster superintendent and school leaders to enhance professionalism toward curriculum customisation. As participants interacted, the discourse enabled them to benefit from the socially constructed knowledge. Teachers were encouraged to experiment with various alternative assessment methods and to conduct classroom action research. The teachers learned from their participation in the sessions and returned to their own schools to spread the learning experiences among their colleagues.

To reiterate, a mini-learning symposium to promote learning among the participating teachers through sharing the alternative assessment innovations and the progress made in the classroom action research was organised annually by the cluster superintendent and school leaders. Additionally, at the end of the one-year learning journey, the individual schools' action-research reports and reflections were documented into an annual publication published by MOE. The findings drawn from the studies were used to inform policies at the macro level and practices at the school and classroom levels.

### 6.4 Micro level: classroom level

Micro level is the classroom settings where the teachers conduct action research on alternative assessment. Teachers scaffolded and monitored students' learning progression through formative assessment and the analytic rubrics developed, and provided timely feedback on the students' conceptual difficulties and alternative conception. Data of the classroom action research were collected, analysed, reported over time, and discussed within and across schools.

Besides the advantages we have described, there are two main challenges in practising Alternative Assessment as formative assessment at the classroom level if we are to bring this to scale as a system. While descriptive feedback, instead of evaluative feedback, should be emphasised on formative assessment ([Black and Wiliam 1998](#)), many teachers in general would tend to focus more on the latter than former. Although some teachers believed in Alternative Assessment as a revamp assessment practice, we recognise that the majority of the teachers would still perceive Alternative Assessment as either supplement or complement to the existing practices (c.f. [Tan 2013](#)). Especially in the critical years where high-stakes examinations are eminent, to practise Alternative Assessment would still be challenging. Hence, the Ministry of Education in Singapore has initiated policies to change the assessment milieu in the years of schooling that are malleable to reform both at the primary and secondary

levels (Singapore Ministry of Education 2009, 2010a). An important goal of this paper is to argue that educational reform should best be attended to a level that involves teacher-change process, in particular with teachers engaging in authentic assessment practices. It is true that policies enable model resources to be developed, but these would not be adopted by teachers even if the state ‘build it’ —‘it would not just come.’ These reforms must be supported by school leaders as they take reference from policy initiatives in assessment (Singapore Ministry of Education 2009, 2010b).

## 7 Conclusion

This study offers some insights into how collaboration among teachers, facilitated by an initial structured design, enables teacher learning. The study illustrates a specific case of how a reform journey in education, of which assessment plays a critical role, can progress through the system successfully. If we begin by doing relatively simple and small learning endeavors with and for teachers, and put meaningful structures to support teachers, partnerships for both collaboration and mentoring among teachers can occur. Partnerships between schools and university as well as the productive structured (“tight-loose”) designs for the collaborative learning process are possible leverages to enable change in education to take place. Assessment is a powerful tool in any education system. If educators and policy makers can harness this tool in their reform agenda, large strides in 21st century learning can follow.

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## Appendix 1

**Some sample items of the teacher questionnaires adapted from Ogan-Bekiroglu (2009, p. 38).**

*Section-1a: Please indicate what degree your assessment cover the following cognitive levels.*

Assessments that measure student reasoning	0 1 2 3
Assessments that measure student recall knowledge	0 1 2 3

*Section-1b: Please indicate what degree you use the following assessment methods.*

Examinations composed of common national exams (PSLE/O-Level Exams) questions	0 1 2 3
Portfolios	0 1 2 3

*Section-1c: Please indicate what degree you consider the following items when you evaluate students’ performances.*

Student effort—how much the student tries to learn	0 1 2 3
Improvement in performance since the beginning of the year	0 1 2 3

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