

Adaptation and Co-Construction: An Investigation of Macau's Small Class Teaching Policy

Sammy King-Fai Hui¹, Kwok-Tung Tsui² & John Chi-Kin Lee³

Abstract

This paper reports a case study of a six-phase research project commissioned by the Government of Macau Special Administrative Region to evaluate the effectiveness of its small class teaching policy in enhancing school development, curriculum management, teacher instructional practice and student learning. Three Macau primary schools with diverse backgrounds were investigated in depth. School principals and teachers were interviewed with a view to gauging the effectiveness of the implementation of the small class teaching policy. The parameters by which the schools adapted and co-constructed the small class teaching policy included the way in which the policy was interpreted, the way school-based curriculum and teacher professional development were managed, and the way in which classroom teaching, learning, and assessment strategies were used in class. Processes involved the interpretations and actions of different school actors in order to adapt and adjust the policy to suit their own school's needs. The paper closes with recommendations for the Macau Special Administrative Region Government to consider in the context of sustainable development of both the policy and the city.

Keywords: small class teaching; educational policy; case study; Macau

1. Introduction

After the return of sovereignty to the People's Republic of China in 1999, the Government of the Macau Special Administrative Region (SAR) placed strong emphasis on the implementation of a policy for quality education. According to Article 122 of the Macau Basic Law (<http://www.wipo.int/edocs/lexdocs/laws/en/mo/mo019en.pdf>, p. 21), all educational institutions have autonomy in teaching, and academic freedom, and are free to continue to recruit staff and to use teaching materials from outside the Macau SAR. Students have freedom to choose educational institutions and the freedom to pursue their education outside the Macau SAR if they so desire. These policies are measures that respond to changes in Macau's social and economic structure, and to the change in population size and work force in particular.

According to government statistics, Macau's birth-rate had fallen by about 50% from around 8,000 in the mid-1900s to about 4,000 at the time of the establishment of the SAR Government in 1999 (Statistics and Census Service [DSEC], 2018). The student population in the non-higher education sector dropped from 98,000 in 1999/2000 to 74,000 in 2016/2017 (Education and Youth Affairs Bureau [DSEJ], 2005 & 2017). Consequently, schools are facing a worrying situation in the face of this reduction in student numbers. The drop in the birth rate and the school population is also a concern for both government officials and the general public, particularly in light of Macau's gaming-industry-dominated economy (Fong, Fong & Li, 2011; Wu & Chen, 2015). Although Macau's gross gaming revenue far exceeded that of Las Vegas since the liberalization of casino licensing in 2002, the percentage of Gross Domestic Product (GDP) shared by the gaming industry has started to drop in recent years (Gaming Inspection and Coordination Bureau [DICJ], 2018). Given Macau's limited land mass (30 square kilometres), a broader-based economic structure, and a related manpower and education policy, is needed to contribute to the city's sustainable development (Sheng & Gu, 2018).

¹ The Education University of Hong Kong, Hong Kong, 10 Lo Ping Road, Tai Po, N.T., Hong Kong. E-mail: skfhui@eduhk.hk

² The Education University of Hong Kong, Hong Kong, 10 Lo Ping Road, Tai Po, N.T., Hong Kong. E-mail: kttsui@eduhk.hk

³ The Education University of Hong Kong, Hong Kong, 10 Lo Ping Road, Tai Po, N.T., Hong Kong. E-mail: jcklee@eduhk.hk

“Developing Macau through education” was introduced as the Macau SAR Government’s ten-year development plan for non-tertiary education from 2011 to 2020 (Non-Tertiary Education Council, 2012). In the current critical period of very active development, the Macau SAR Government has committed itself “to raising the level and efficacy of education investment” (Government Information Bureau [GCS], 2015, p. 10).

One of the most forward-looking education policies implemented by the Macau SAR Government to prepare its youth is the small class teaching policy. The term ‘small class teaching’ first appeared in Macau’s economic budget in 2001. It aims to provide subsidies to schools to support free education for all students in any classroom that follows the set size of 25 to 35 students per class (Education and Youth Affairs Bureau [DSEJ], 2013). Under the implementation of 15 years of free education in 2006/2007, the amount of the subsidy rises every year. For example, for each class in primary school it increased from 570,000 Macau dollars in 2011/2012 to 955,000 Macau dollars in 2018/2019. By the year 2016/2017, 86.0% and 90.0% of Macau’s pre-schools and primary schools had already joined this subsidy scheme (Education and Youth Affairs Bureau [DSEJ], 2017). Differing from any top-down strategy or technical-rational perspective of policy implementation, Macau’s small class teaching policy relies on the adaptation and co-construction perspectives, which emphasize variation of fidelity viewpoints and the roles of actors in the policy process (see for example Datnow & Park, 2009). There is also an intention to harmonize the differences in resource use among private schools (Vong & Wong, 2014). Policy in this regard is conceptualized not only as “text” but also as “discourse”, in the way it represents schools, school principals and teachers, as well as the way in which these actors adapt and adjust the policy to their own school contexts (Fimyar, 2014). Policy as discourse highlights “the way in which policy ensembles, collections of related policies, exercise power through a production of truth and knowledge” (Ball, 1994, p. 21). Although policy as text needs to represent itself as “true” and “correct” through control of both the encoding mechanism (via struggles, compromises, authoritative public interpretations and reinterpretations) and the decoding mechanism (via actors’ interpretations and meanings in relation to their history, experiences, skills, resources and context), policy as discourse opens up the possibilities for actors to have a critical understanding of a given curriculum policy or initiative, by questioning and careful application.

The small class teaching policy, as a territory-scale educational reform, has been implemented in Macau, subsequent to the introduction of 15 years of free education, since 2006/2007. The goal of reducing class size has been achieved (Non-Tertiary Education Council, 2012) and in 2015/16 Macau schools had on average 28.3 students per class (Government Information Bureau [GCS], 2016). As the schools have autonomy, and teaching and academic freedom, under the policy, it was believed that the success of the implementation of the small class teaching policy would be the result of the joint effort of local educators at multiple levels.

The Macau SAR Government has made a great deal of effort to ensure the small class teaching policy functions as a catalyst for quality education outcomes that may be associated with the sustainable development of its economy and growth. To evaluate how school principals and teachers interpret, adapt and adjust the policy, a research team was formed at The Education University of Hong Kong and commissioned to conduct a six-phase study of small class teaching in Macau. This paper reports the findings of semi-structured interviews with school principals and teachers of three Macau primary schools of diverse backgrounds with specific focus on the process of policy adaptation and co-construction.

The research question underpinning the study is:

How do school principals and teachers interpret, adapt and adjust the small class teaching policy in schools, so as to identify the challenges that are embedded in the process of policy adaptation and co-construction and make recommendations for areas of change?

Interviews were analysed with reference to the extent to which the small class teaching policy has been effectively implemented in the three critical domains of policy, curriculum and management; and teaching and learning. Through analysis of the interviews, the processes of policy implementation are uncovered, and related to the schools’ practical and socio-historical contexts.

2. Literature Review

Three critical domains of effective implementation of small class teaching policy in schools

To review the effectiveness of the implementation of the small class teaching policy in Macau, it was necessary to consider the parameters by which the schools adapted and co-constructed the small class teaching policy.

These include the way in which the policy is being interpreted, the way school-based curriculum and teacher professional development are managed, and the way classroom teaching, learning and assessment strategies are used in class.

These three parameters model the practical flow of how an educational policy may be “designed by the government and considered at school level”, “interpreted and integrated into school plans and further articulated into curriculum and teacher professional development activities at management level” and “implemented as teaching, learning and assessment practices at classroom level”.

Policy

The focus of this policy is on promoting education equality and catering for students’ diverse needs within a student-centred learning environment. Class size reduction is the iconic change for the implementation of a small class teaching policy, although the ideal class size remains debatable. A wide variation in class sizes has been observed among countries in both east and west, with, for example, 21 students per class in the United States and 38 students per class in Mainland China (Blatchford, Galton & Lai, 2016, pp. 3-4). The suggestion from The Organisation for Economic Co-operation and Development in 2015 is 21 students per class in primary schools (The Organisation for Economic Co-operation and Development [OECD], 2017, p. 357). Meanwhile, for successful implementation of a small class teaching policy, planning and implementation measures at both government and school levels play an important role. Sufficient resources, together with a wide network of external experts and consultants, further boost the development and implementation of small class teaching in schools. Policy continuity (Ali & Baig, 2012) is another factor that needs to be taken into account, as schools need time to adapt to small class teaching policies.

Curriculum and professional development

The focus of this parameter is on the development of school plans which support the implementation of a small class teaching policy, and which take a school’s unique culture and characteristics into consideration (Lee, 2012). The school plan sets out the focus of a school’s curriculum that best allows teachers to design teaching and learning strategies to cater for students’ learning diversity in a small class teaching environment. Both school leadership and teacher professional practice are of equal importance in the successful implementation of policy at school level (Lai, Yen & Lee, 2016).

Teaching, learning and assessment

In this domain, the focus is on the implementation of effective teaching and learning strategies whereby students achieve pre-set learning objectives. In a student-centred learning environment, teachers need to be critical and reflective with regard to a number of key issues, namely: Why should students learn?; What should they learn?; and How may they be supported to learn effectively? In this context, a paradigm shift from teaching to learning is necessary if small class teaching is to be effective (Galton, Lai & Chan, 2014). As such, five key dimensions are used to evaluate the extent of paradigm shift: teaching/learning objectives and content; teaching performance; classroom management; student participation; and assessment.

Policy implementation as adaptation and co-construction

The strategies for policy implementation may be categorized into: (i) a top-down approach – the *technical-rational perspective*; (ii) a bottom-up or bi-directional approach involving a dynamic implementation process between policy and site of implementation – the *adaptation perspective*; and (iii) a multi-directional approach – the *co-construction perspective*. Under a *technical-rational perspective*, applying classical management theory to education reform, successful implementation of a policy is brought by high fidelity to an objectified standard, which refers to policy design provided solely by policy makers (Snyder, Bolin & Zumwalt, 1992). Under a *technical-rational perspective*, policy makers possess the authority to control the organization, including both political and technical processes. Hence, any local variation, meaning any deviation on the practices of local educators – an implementation gap in effect – is considered to be a failure of the implementation of the policy. On the other hand, both adaptation and co-construction perspectives place strong focus on local factors, in that the success of a policy reform relies heavily on how individuals interpret the policy and further formulate and implement it in a local context (Datnow, 2006; Datnow & Park, 2009; Datnow, Hubbard & Mehan, 2002). Hence, under a mutual adaptation perspective, policy from the top only functions as a guide to the reform, and how different local educators further adapt the same policy to achieve expected outcomes should be further investigated.

Under a *co-construction perspective*, since the direction of implementation and changes is multi-directional, there is an emphasis on agents at all levels contributing to the policy-making process, and continuous, dynamic interaction among agents at multiple institutional layers in further shaping the implemented policy. The failure of a reform to fit into the local context is perceived as a failure from a co-construction perspective.

3. Methodology

Samples and participants

Participants in this study were school principals and teachers from three Macau primary schools which joined the subsidy scheme under the “free education school system”. All are private schools: one is sponsored by a non-profit-making non-religious body (School A); two are sponsored by non-profit-making religious bodies (Schools B & C). These schools were recommended by the Education and Youth Affairs Bureau [DSEJ] of the Macau SAR Government for in-depth study. Findings of studying these three schools are not for the purpose of generalization; it is rather that their richness might inform the research question, thereby shedding light for government officials and school practitioners to enhance quality education through examining policy design and the implementation process.

Methods, fieldwork and analysis

Semi-structured interviews with the three Macau primary school principals were conducted at their schools from October 2016 to January 2017. All interviews were conducted in Cantonese and audio-taped, and all lasted approximately an hour. Written consent was obtained from participants. School principals were invited to share their views of how they translated the small class teaching policy into practice in their school in each of the three critical domains (i.e. policy, curriculum and management, and teaching and learning). Interview data were transcribed, translated and analysed through a process of “compare and contrast” for significant themes (Miles, Huberman & Saldaña, 2014). Findings of the school principals’ interviews in terms of interpretative summaries and illustrative quotes are reported.

Interviews with teachers were conducted in the form of post-observation conferences after lesson observations. All four major subjects – Chinese Language, English Language, Mathematics and General Studies – were observed in each school. Schools were given the freedom to select the lessons for demonstrating effective teaching and learning under the small class teaching environment. Lessons were video-taped, with written consent obtained from teachers as well as students and their parents. Each lesson was observed by two experienced observers using a specially designed lesson observation checklist to evaluate the actual practice of small class teaching in the sampled classrooms in terms of the five dimensions of paradigm shift from teaching to learning as presented in the teaching, learning and assessment parameter above. Students or their parents who did not want to participate in the study were excluded. Results of the lesson observations are reported below. Post-observation conferences between teachers and observers aimed to clarify the instructional design principles used in the lessons. Table 1 shows details of the three Macau primary schools and the lessons observed.

Table 1. The three Macau primary schools and the observed lessons

	School A	School B	School C
School type	Sponsored by non-profit-making non-religious body	Sponsored by non-profit-making religious body	Sponsored by non-profit-making religious body
Class size (2016/2017)	18 – 35	17 – 32	26 – 35
Observed lessons	P.6 Chinese Language P.2 English Language P.2 Mathematics P.4 General Studies	P.3 Chinese Language P.5 English Language P.4 Mathematics P.3 General Studies	P.3 Chinese Language P.5 English Language P.4 Mathematics P.1 General Studies

As can be seen from Table 1, all three schools were sponsored by non-profit-making bodies. Of these, two were religious bodies while one was secular. Class sizes varied from 17 at the lower end to 35 at the top end.

4. Findings and discussion

Key themes were retrieved through a compare-and-contrast process from the interviews with the school principals and the post-lesson conference with school teachers. Three major themes emerged, which mesh closely with the three parameters of effective implementation of small class teaching policy.

In particular, five sub-themes were identified to illustrate the adaptation and co-construction policy processes: (i) the way small class teaching policy was being interpreted (under the *policy domain*); (ii) the development of school-based curriculum and the impact of curriculum leadership (under the curriculum and management *domain*); (iii) strategies adopted to facilitate teacher professional development (under the curriculum and management *domain*); and (iv) the use of diversified teaching, learning and assessment strategies in the classrooms (under the teaching and learning *domain*).

In the findings below, interpretative summaries and illustrative quotes are used to support the analysis of how those dimensions were adapted and adjusted in light of the official policy. Critical factors contributing to successful policy co-construction are discussed.

Small class teaching policy for securing resources

All three principals agreed with the introduction of the small class teaching policy. For the benefit of students, they found that a smaller class size could bring students closer to teachers and supported better student learning. The importance of small class teaching in integrated education was further highlighted. Teachers were able to know their students better, cater more for diverse learning needs, and facilitate the use of different teaching and learning strategies. They supported the government's rationale of implementing this policy as a response to the drop in the birth rate, and commented thus:

If the class size is raised to 35 students per class, it will be too large as the workload of teachers will become too heavy, therefore a class consisting of 30 students is the optimal and we are working towards to this class size (Principal of School A)

Especially for teaching, before the implementation of the small class teaching policy, lessons were more teacher-centred and because of the large class size, classroom teaching was either the teacher asking questions with students answering, or the teacher spending most of the time on elaborating content in the textbook. The extent of student engagement was limited as they only listened to what was being taught by the teacher and learning activities were limited. But now, after the implementation of the small class teaching policy, teaching methods have changed, and teachers are more able to integrate the elements of collaborative learning and explorative learning into their lessons with more interaction from students. The benefits brought by these diversified teaching styles were not limited to increments in both knowledge gained and student engagement, but also in enhancing students' interpersonal skills and teacher-student relationships" (Principal of School C).

The above quote demonstrates a positive attitude by the principals toward the small class teaching policy.

The range of 25 to 35 students gives schools the freedom to decide class size and the optimal number of classes. However, the three principals showed more concern about the way in which the class size policy was linked to subsidies. To prepare for student dropouts, the three principals intentionally attempted to admit more than the lower boundary of 25 to about 30 students each class. School background and geographical location, however, put limits on effective planning of the student intake. Critical issues here included whether there is an attached pre-school and secondary school, the size of the student population in a district, and competition among neighbouring schools. Schools A and B were able to manage to recruit enough students for one class via a variety of strategies. For School A, since there was no directly linked secondary school, the school did a lot in terms of parent education from pre-school onwards, hoping more students would choose to stay for primary school education. Further, the school allowed parents on shift duty in the gambling industry to pick up their children late – although this put pressure on school staff. School B has its own pre-school and secondary school but competition for entry in the district is keen and the school also admits a considerable number of students with special education needs. As a result, over the past few years the school has split some classes into two for subjects where there is considerable learner diversity. For these two principals (i.e., A and B), supporting the sustainable development of the small class teaching policy means having more resources for a stable and professional teaching staff force. The Principal of School A always applied for different government grants for expenses, which aimed to provide teachers with a competitive salary, and which could provide more support for changes to teaching strategies under the small class teaching environment. The Principal of School B always tried to collaborate with neighbouring schools over teacher professional development activities in order to make better use of resources. In the two principals' words:

As long as we follow the guidance given by the DSEJ [Education and Youth Affairs Bureau] on class size and student-teacher ratio, sufficient support including financial support may be obtained. This helps a lot, for example, with the implementation of the 'double teacher system'. (Principal of School A)

If our school invites an expert on Asperger's Syndrome to give a seminar to our teachers, it will be a waste of resource as the whole teaching team only consists of around 20 teaching staff. Sharing resources with other schools achieves better allocation of resources. (Principal of School B)

The small class teaching policy is adapted and adjusted in Schools A and B to support the use of resources for quality teachers and quality teaching. How policies are enacted ultimately depends on the way they are interpreted within the school context (Braun *et al.*, 2011; McLaughlin, 1987). The Macau SAR Government would be well advised to continue to provide resources to schools, to assess their needs on an individual basis, and to review the use of resources with schools so as to maintain sustainable development of the policy and of the territory.

School-based curriculum development and the role of curriculum leadership

According to the UNESCO International Bureau of Education [UNESCO-IBE] (1995-2018), school-based curriculum development refers to:

A curriculum developed at the level of an individual school. This notion suggests a decision-making process with regard to the curriculum involving school staff, ranging from individual teachers adapting existing curricula to the whole school staff collaboratively working together to develop new curricula in order to make them more relevant and meaningful for learners.

Within this context, a school plan functions as a guide for school principals and teachers to formulate strategies for school development at different levels. It also sets the direction by which schools may achieve excellence. A school-based curriculum thus allows a particular school to best design what and how learning may take place, to build upon a school's strengths, and to take into account students' characteristics and learning needs.

Under Macau's centralized "Curriculum Framework for Formal Education of Local Education System" and "The Requirements of Basic Academic Attainments of Local Education System" (Education and Youth Affairs Bureau [DSE]], 2014), schools have complete freedom to develop their own school curriculum. The implementation of a school-based curriculum and small class teaching are recommended by the government as two major measures to enhance quality teaching and learning in schools (Non-Tertiary Education Council, 2012).

While all three schools closely followed the government's curriculum framework to support students' academic attainments, the majority of interviewed school principals and teachers were not familiar with producing their own school-based curriculum. Key areas here related to the teaching and learning domain highlighted in their school plans – the better use of cooperative learning, self-regulated learning and e-learning, etc. Subsequently, Schools A and C established different subject curriculum teams to strengthen the support of student learning at the classroom level. To meet the requirements listed in the curriculum framework for students' academic attainment and to best design teaching progress, regular curriculum team meetings were held and led by subject heads of department (HoD) to drive teaching excellence in school. They aimed not only to fine-tune teaching materials and to suggest teaching and learning activities, but also to share teaching experiences and to follow up with peer lesson observations to identify individual teachers' teaching strengths and weaknesses. The role of subject HoDs, as middle management leaders, was critical to whether the teams could bring about a positive impact on teachers' instructional practices and on student learning.

To illustrate this, School C is analysed from the perspective of the way in which one of its subject HoDs functioned as curriculum leader – of Chinese Language and Mathematics. Owing to the rich experience which the subject panel had of these two subject areas, she also took on the responsibility of overseeing the implementation of the curriculum by all teaching teams. While it took her a number of years to produce a curriculum with which the school was happy – making extensive revisions to published textbooks and getting teams to fine-tune their own teaching materials to suit students' needs and the small class teaching environment – the process did result in positive outcomes and visible impact. As various stakeholders in School C commented:

We work under the government listed curriculum framework, and the curriculum that we are now using is basically designed by us. These are the efforts of different curriculum teams. (Principal of School C)

The school has given us [the curriculum teams] a great deal of freedom on development of school-based curriculum. [...] This is indeed the school culture and there are close relationships among team members. We will make change to the curriculum and teaching practices if we think the changes are good for students. (Curriculum leader of School C)

Curriculum team meetings are held on a weekly basis. The purpose of for example the preparatory session is to have discussions about teaching progress and preparation of teaching materials. [...] Even if we use the same teaching materials, different teachers may well use different teaching strategies. Hence, we have peer class observations in each semester and after that we have discussions about the best strategies for evaluating what might support the best learning outcomes. (P.4 Mathematics teacher of School C)

The above quotes illustrate how the small class teaching policy was translated into the school curriculum and adapted at classroom teaching and learning levels. The roles and functions of middle leaders within a school context are critical. To better support the co-construction of the small class teaching policy, it is recommended that the Macau SAR Government make the most of curriculum leadership for school-based development.

The research literature recommends the concept of educational leadership with respect to any type of school-based development. Hui & Cheung (2006, p. 183) argued education leaders should realise the essence of educational leadership – the art of “leading as critical learning”. The responsibilities of these leaders include: (i) formulating and communicating the school’s mission and goals; (ii) promoting, supervising, and evaluating quality teaching, coordinating the curriculum, and monitoring student learning; (iii) promoting professional development, establishing positive expectations and standards, and providing incentives for teachers and students; and (iv) creating a safe and orderly learning environment, providing opportunities for meaningful student involvement, developing staff collaboration and cohesion, as well as forging links between home and school (Murphy, 1990). In Hong Kong, these responsibilities have long been part of curriculum leaders’ remit. As set out by the Education Bureau of the Hong Kong SAR Government, curriculum leaders are expected to: (i) assist schools and the school head to lead whole-school curriculum planning and facilitate implementation of a school’s plans; (ii) support the school head in planning and coordinating assessment policy and assessment practices; (iii) lead teachers/specialist staff in improving learning and teaching strategies; (iv) promote a professional exchange culture; and (v) take up a reasonable teaching load (Education Bureau, 2010). Strong research evidence has been found in Hong Kong of the positive impact that curriculum leaders bring to school-based curriculum development and education reform (Kennedy & Hui, 2006; Lee, 2014; Tsui, 2014). Curriculum leadership paves the way for quality education and student learning within a set curriculum framework. This is an issue that the Macau SAR Government would be well advised to explore further.

Teacher professional development for quality teaching and learning

All three principals emphasized the merit of small class teaching in promoting quality teaching and learning. Teacher professional development relates to a large extent to teaching quality and learning engagement as well as to a school’s success. For example, in 2008/09, the Macau SAR Government launched an exchange programme called “Introducing Outstanding Teachers from Mainland China to Macau”, which aimed to strengthen Macau teachers’ teaching and research abilities with on-site professional support from outstanding teachers from Mainland China. All three principals joined this programme and praised the Mainland China outstanding teachers’ contributions to helping teachers improve their teaching competency. As the Mainland China teachers were not regular school staff they could thus function as a type of ‘critical friend’ to identify teaching deficiencies and possible improvements. Principals commented thus:

The Mainland China outstanding teachers’ programme actually helped to consolidate the Macau experience. These teachers are not restricted to any school culture and they proposed initiatives like inter-school lesson observations. [...] These teachers function as a catalyst to initiate change of current teaching practices through sharing teaching experiences. (Principal of School A)

Inviting teaching experts from Mainland China to provide on-site teaching guidance is good. This allows local teachers to gain insight and experience of, for example, new teaching methods and pedagogies in a small class teaching environment. (Principal of School C)

Although the Mainland China Outstanding Teachers programme was not directly linked to the small class teaching policy, all principals took advantage of the presence of the Mainland China teachers to conduct different professional development activities that would enrich their teachers’ subject content knowledge and pedagogical skills. These activities included primarily: the design of teaching materials, peer coaching, and lesson observation and evaluation. After the departure of the Mainland China teachers, under the guidance of school principals and subject HoDs, the trial professional development activities were continued and extended in the three schools, with refinements to the practices to fit the different schools’ needs.

As a result, various forms of communities of practice were formed in schools among groups of teachers who shared common concerns or passions for enhancing teaching and learning (Wenger, 1998). More strategies were utilized in the three schools to enhance teaching effectiveness.

For example, School A adopted a mentoring system for new teachers and started to conduct subject-based inquiry, School B collaborated more with neighbouring schools in organizing teacher professional development activities such as inter-school lesson observations and overseas educational visits. School C conducted subject-based action learning and research for subjects such as Chinese Language, Mathematics and General Studies with a view to trialling game-based and inquiry-based learning.

Triangulating with data from post-lesson conferences, the majority of teachers found these professional development activities stimulating and useful, especially in identifying weaknesses in their current practices and ways to improve their teaching plans. Such interconnections and actions among school principal, teachers and other education workers within a particular school context form the basis of a *co-construction* policy – although the interconnections and actions may not be understood beyond the school context in which the actors mutually engage, react and create. As Datnow and Park (2009) comment: “the co-construction perspective recognizes that agents at all levels contribute to the policy-making process and that process is characterized by continuous interaction among agents and actors within and between the levels of the system” (p. 351).

In an attempt to support more co-construction in the small class teaching policy through teacher professional development, it is recommended that the Macau SAR Government facilitate the formation of learning communities within and across schools, or even consider certain forms of action learning and research, to help teachers consider how their teaching may be enhanced through the trialling, and mutual exchange, of ideas. In the development of teacher professional learning communities – now an accepted international trend – Hong Kong, for example, has been successful in mobilizing different education partners for different levels of collaboration in schools (Lee, 2013). Such relatively local experience can be beneficial to the Macau SAR Government in proposing different support systems to create synergy in schools for quality teacher professional development, as well as quality teaching and learning. In promoting action learning and research by teachers, Hui’s (2010) study recommended placing emphasis on the significance of research in two ways. The first centres on a *communal sense* and relates to teacher professional development; the second centres on a *pedagogical sense* and relates to providing solutions to teaching and learning deficiencies at the classroom level. These two senses of research significance often imply one another. Thus, co-construction in the small class teaching policy for teacher professional development should allow teachers to interpret, from their own school contexts, how action learning and research may improve teaching, with teachers thereby identifying and tackling student learning problems, as well as critically examining recommendations in the literature regarding possible solutions.

Use of diversified teaching, learning and assessment strategies for supporting small class teaching

As mentioned, lesson observations of the four subjects were conducted in each school under the five learning/teaching dimensions. In post-observation conferences, interviewed teachers were all in agreement that the implementation of the small-class teaching policy had positively influenced their teaching. In particular, they emphasised the use of cooperative learning, which had been a key training focus in the context of effective small class teaching strategies. Teacher comments in this regard were:

Students in a group could help each other, especially those who require extra academic support. (School A P.2 Mathematics teacher)

Teachers could then have more spare effort for classroom management, observing different students’ learning progress and providing guidance and support for those identified as having learning difficulties. (School B P.3 Chinese Language teacher).

Macau teachers can be seen to be growing accustomed to the design of lessons with various teaching and learning strategies – with a view to targeting learning objectives and diverse students’ learning needs.

One lesson from each of the three primary schools will now be briefly commented upon: a P.2 English language class in School A; a P.1 General Studies class in School B; and a P.4 Mathematics lesson in School C.

The three lessons were designed with clear learning objectives which belonged not to a “low” level of “transmission” but a “medium” and “high” level of “application” and “understanding” (Galton, 2002 & 2010). For example, those objectives included: “to apply knowledge of transportation in students’ daily conversation and dialogue” (P.2 English Language), “to take advantages of the characteristics of water (no fixed shape) to move it” (P.3 General Studies), and “to compare the volumes of different containers with different methods” (P.4 Mathematics).

To support the objectives, all three teachers used pair or group works to engage students to construct their knowledge gradually. For example: (i) a 15-minute group activity was designed for the P.2 English Language students to integrate the newly learnt vocabularies into their daily conversations with the use of corresponding prepositions; (ii) equipment and task-sheet were set for the P.3 General Studies students to solve the real problem of “transporting” the water; and (iii) an actual experiment on arranging the containers in sequence based on their volumes was conducted by the P.4 Mathematics students for observation and discussion. Use of different cooperative teaching strategies like Jigsaw, Think-Pair-Share, and Three-Step Interview were also recorded in lessons other than these three. In terms of feedback, under the small class teaching environment, all three teachers spent considerable time in class giving feedback on students’ performances. The feedback was not only formative in nature, but also extended to elaboration that helped students enhance their understandings of learning objectives and guided them in identifying their own weaknesses. For example: (i) the P.2 English Language teacher invited individual students to come out to answer the raised questions and then helped them improve via giving feedback on their answers; (ii) the P.3 General Studies teacher relayed one of the groups’ answers related to the characteristics of water (that group had claimed the fact that water can be used to wash dishes as one of the characteristics of water) to the whole class, to determine whether that was a correct analysis; and (iii) the P.4 Mathematics teacher walked through each student group for questions and feedback on their experiments.

In terms of assessment, there were no assessment tasks set for the observed lessons, with teachers relying on the designed teaching and learning tasks to decide whether students had achieved the objectives. Such an approach matches recent reform in assessment, in that it emphasises learning-oriented assessment, integrating assessment elements into learning (see Carless et al., 2006; Hui, 2015). With analysis of the three lessons, the small class teaching policy was translated into classroom practice in terms of cooperative learning – meaning that the small class learning environment supported the achievement of learning outcomes with high levels of student engagement and questioning techniques. Concerning the use of in-class assessment strategies, teachers are recommended to note the second and third elements of learning-oriented assessment: namely, students as evaluators and feedback as feedforward. These elements are seen as ways to enable more students in class to assess and improve their own performance, as well as providing feedback at early stages for improvement.

From the co-construction perspective, given that diverse teaching strategies are used by different teachers, the supportive role played by principals and HoDs and curriculum leaders should also be taken into account in a small class teaching environment. HoDs, as experienced teachers, may share their experiences and feedback in curriculum team meetings since such meetings provide important guidance for the teachers to hone their teaching plans and strategies. In the current study, all three interviewed principals stressed that examinations were not the only assessment tool for evaluating students’ learning progress, and that they saw shared assessment as profitable student learning support. The need for diverse assessment strategies, such as evaluating student engagement in classroom learning activities and providing subsequent additional academic support for students with special education needs, was an issue frequently commented on by principals. Such an emphasis is key in helping teachers to create a favourable small class teaching environment for students with diverse learning needs.

5. Conclusion

This paper reports a case study of a policy research project which evaluated the effectiveness of small class teaching policy on enhancing school development, curriculum management, teacher instructional practice and student learning in Macau. The study reports the views of principals and teachers, in terms of their interpretations and actions, directly or indirectly associated with the way they adapted and adjusted the policy to fit their own school context. From the set of interviews with principals and teachers, it is clear that the sustainable development of the small class teaching policy is in part related to greater resources for a stable and professional teaching staff force. With the fall in Macau’s birth-rate over past years, it is understandable that school principals might be concerned about whether they will have a sufficiently large student intake to meet the minimum class size of 25 students per class as stipulated by government policy. The Macau SAR Government, in this regard, should consider re-examining the policy to better fit the local situation.

While the three schools participating in the study adapted the government’s curriculum framework and student academic attainment requirements, their current curriculums could be further strengthened through empowering the curriculum leadership roles of school middle leaders. Teacher professional development programmes were found to empower teachers with the knowledge and skills necessary to address ever-changing work challenges.

The existence of learning communities provided evidence of policy co-construction, through which quality teaching and quality learning and engagement were all evident. Multiple forms and formats of teacher professional development activities, leading to a shared vision and to a community of practice among teachers within and across schools, should be the vision of the Macau SAR Government for its schools. At the classroom level, apart from clear objectives and engaging teaching and learning strategies, assessment was seen to function well in terms of getting students to improve by means of evaluation and feedback.

To conclude, from the analysis of the interviews and post-lesson conferences, it is apparent that successful policy adaptation and co-construction requires the long-term joint effort of the Macau SAR Government and of its schools. The proposed small class teaching policy involves the use of various public resources to address the fluctuation in student numbers and other socio-historical contexts, along with the development of the Macau education system and schools (Galton, Lai & Chan, 2014). While challenges remain, the small class teaching policy has proved to be a worthwhile measure to help schools achieve quality education as well as supporting the city's sustainable development.

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