

**Presented at the Annual Conference 2009 of the British Educational Research Association, University of Manchester.**

**Lesson and Learning Study: a globalizing form of teacher research.**

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The state of Teacher Research in the UK

If a teacher wants to learn how to teach a particular topic what body of knowledge can s (he) turn to? For example, is there no body of professional scholarship on how to teach ‘fractions’ or ‘rotation and revolution of the moon and the earth’? It is now 40 years or more since Lawrence Stenhouse coined the idea of ‘the teacher as a researcher’ who engaged in systematic self-study “through the study of the work of other teachers and through the testing of ideas by classroom research procedures.” (1975, Ch 10) Many would claim that the idea is alive and well as a well established approach to school improvement and on postgraduate CPD programmes.

If so, then why no systematic structuring of what teachers have learned through their research, organised around the topics the national curriculum requires them to teach? Some might argue that such a systematic structuring of a shared body of professional knowledge is impossible since each teachers can learn through research only how to teach a topic to a particular class in a particular school. His/her knowledge will be situation specific and at best only represented in the form of a case study. For Stenhouse the problem was not so much epistemological as psychological and social. Teacher research required the adoption of a self-critical stance and a willingness to submit one’s work to the scrutiny of others. Stenhouse argued that, in order for teachers to capture and express their emerging insights to each other, they needed to

develop a common vocabulary of concepts and a syntax of theory. Such a theoretical framework of concepts should be testable by teachers and open to the development of new concepts and theory. (p.157)

Under the conditions outlined, Stenhouse claimed that it should be possible to synthesise teachers' case studies to distil general trends and insights and organise them as pedagogical knowledge in propositional form, albeit open to revision in the light of an accumulating repertoire of cases. (p.157) He believed that such conditions could be achieved "through a mutually supportive co-operative research in which teachers and full-time research teams work together." (p.159)

I would argue that in spite of appearances high quality co-operative research has been the exception rather than the rule in the UK for the following reasons:

1. The prescribed programmes of study for the national curriculum have left little space for teachers' research with respect to how the student's experience of topics is structured. At best the teacher may have discretion with respect to the teaching methods used to implement a particular way of structuring learning.
2. The UK national curriculum effectively decontextualised 'teacher research.' It is many years since people understood teachers' research as a form of curriculum development. Stenhouse saw curriculum development as the context for teacher research. As such it was inextricably linked with the testing and development of theory. Disconnect 'teacher research' from curriculum development and one disconnects it from the testing and development of a theoretical framework of concepts that enable teachers to meaningfully talk about their work together. A theoretical framework of concepts expressed in books was "not easily taken into

- possession by teachers.” (p.142) It was, he argued, best expressed as curriculum specifications where teachers in classrooms conceived as laboratories exposed it to testing. Hence curricula were not to be regarded as prescribed programmes of study but “as a provisional specification claiming no more than to be worth putting to the test of practice,”
3. Many professional researchers originally engaged with teachers’ research came from the field of Curriculum Studies. Some were subject experts while others had more generic capabilities as curriculum theorists, designers and developers, and evaluators. Most had experience of collaborating with teachers to change the curriculum in schools. Increasingly professional research support has been drawn from fields like school improvement and teachers’ professional development that have long been disconnected from curriculum studies. Indeed the latter has withered away in universities under the influence of a highly prescriptive and centralised national curriculum. Hence, the increasing lack of attention classroom action research has given to ways of structuring learning experiences in relation to specific curriculum content.
  4. The classroom research procedures, which have been deployed in the context of ‘teacher research’, have been called into question as guarantees of objective knowledge, as is reflected in the lack of research council funding for collaborative action research with teachers. This has resulted in an obsession on the part of some professional educational researchers with methodological as opposed to educational justifications for such research and attempts to transform their work into an applied social science (see Elliott 2009).

#### The re-emergence of teachers’ research as a form of curriculum development in the Far East.

Stenhouse's idea of ‘the teacher as researcher’ has re-emerged in Confucian East Asia and in the process offers the prospect of

developing systematic bodies of pedagogical knowledge that empower teachers to resolve a persistent global problem: namely, what has become known as ‘the achievement gap.’

In 2007 the World Association of Lesson Study held its inaugural conference in Hong Kong in the wake of the growing international interest in Japanese Lesson Study (see Matoba, M, Crawford. K.A, Sarkar Arani. Mohammad R Eds. 2006 and Lewis, Perry and Friedkin 2009) and its transformation in Hong Kong into Learning Study (see Lo, Pong and Pakey Eds. 2006). At the heart of Lesson Study is the collaborative development of a ‘lesson’, regarded as a unit of study built around a topic rather than a unit of time as such) through a series of ‘research lessons’. Teachers engaged in teaching the same lesson observe each other teaching it in turn, pooling their observations between lessons as a basis for making collective decisions about further changes to the lesson plan, which are then subsequently tested in the next research lesson. In Hong Kong Japanese Lesson Study was fused with a phenomenographic theory of learning developed initially in Sweden and then in Hong Kong by Ference Marton and his co-workers (See Marton and Booth 1997, Marton and Morris Eds. 2002, Marton and Runnesson 2003, Marton and Tui 2004, Marton and Pang 2004, Lo, Pong and Packey 2005). This theory is known as ‘Variation Theory’. In Sweden, and at first in Hong Kong, the theory was tested in a variety of curriculum areas through ‘design experiments’, where teachers collaborated with researchers to test the theory but the primary responsibility for data gathering and analysis, largely pre and post test data, lay with the latter.

In the Hong Kong curriculum reform context teachers have been given responsibility for developing school based curricula within a national framework of Key Learning Areas and Tasks, Aims and Goals, Values and Pedagogical Principles. The Hong Kong Government had encouraged and supported teachers’ action research as a basis for such development. In this context Lo Mun

Ling grasped the potential of Variation Theory as a theoretical framework of concepts that might enable teachers to address the 'learning gap' in lesson and curriculum planning. She linked Variation Theory to a procedural package that fused the Swedish Learning Study, conceived as a design experiment, with the Japanese Lesson Study, a collectivist form of teachers' action research based on peer observation and aimed at improving lesson plans. Through the use of Variation Theory as a framework for structuring learning experiences in HK schools, Lo Mun Ling effectively reinstated school-based curriculum development as a context for teachers' action research. In doing so she reasserted the link Stenhouse had made between teacher and curriculum development when he claimed that there could be no curriculum development without teacher development. However, Lo spelt out the reciprocal nature of the link when she claimed that there could be no teacher development either without curriculum development. Variation Theory highlighted the need of teachers to develop their actionable pedagogical knowledge through curriculum development.

The transformation in Hong Kong of Lesson Study into a form of Learning Study structured by Variation Theory has challenged a currently widespread western assumption that action research is about the development of practice rather than theory. The action research context has, as I shall show later, resulted in the further development of Variation Theory as it was tested in use.

### Variation Theory as a theoretical framework for school based curriculum development.

Lo and Pong (2006 p.10-11) summarise the outcomes of phenomenographic research into learning experiences as follows:

1. People experience the same phenomenon in qualitatively different ways.

2. Variation will tend to be limited to certain patterns.

3. Students bring their own beliefs and ideas into the formal learning situation and these may conflict with what the teacher tries to teach. Students understand the same curriculum material or teaching act differently.

For example, the transmission of factual knowledge may be seen as something to be regurgitated or as challenging existing beliefs and requiring deep reflection.

4. Variation in discernment of the same phenomenon will result in variable learning outcomes - as a norm rather than an exception.

5. Although people experience different understandings of the same object they often assume that others understand it in the same way as they do.

Hence it is only too easy for teachers to assume that their pupils will come to understand something in the way they intended.

Given the different ways individual students experience the same phenomenon, Lo and Pong, argue that teachers need help to develop a pedagogy that caters for individual differences. The central task of such a pedagogy “--- would be, first to find out what these different ways of understanding are and, second, to consider how teaching should be structured to enable students to see what is taught in the intended way.” ( p.11) A pedagogy that caters for difference will accept the following reasons for students’ incomplete understandings of the subject matter:

- 1) Their intuitive ways of understanding,
- 2) They fail to focus on all the critical features of what is to be learnt.

3) They have not been exposed to suitable learning experiences in the lesson that would have enabled them to learn.

In doing so it will challenge, Lo and Pong claim, the common view that what prevents students fully understanding subject-matter is their lack of ability or the failure of their teachers to arrange the classroom as a learning environment in ways that motivate students.

Variation Theory builds on phenomenographic research findings a theoretical framework of concepts aimed at helping teachers to structure learning experiences in ways that cater for individual ways of seeing.

As such it is best described as a *pedagogical theory* rather than simply a learning theory. The key concepts, which constitute the conceptual framework of Variation Theory, are outlined by Lo and Pong as follows (pp. 14-20):

1. The **object of learning - intended, enacted and lived.**

The objects of learning are the ends towards which learning activities are directed and how they are understood by learners. Such ends have a general and specific aspect. The former refers to the capabilities to be nurtured in the learners while the latter refers to the subject matter upon which the capability is being developed or exercised. I have discerned a tendency in the variation theory literature for the term 'object of learning' to be used to refer to specific aspect of the ends of learning rather than the general aspects. This is regrettable since it can leave the impression that 'objects of learning' are confined to the development of intellectual capabilities and therefore that variation theory does not apply to other learning areas. Lo and Pong have argued that the use of the term need not be confined to understanding a concept or theory but may also be associated with the development of a skill, attitude or value. (pp.14-15).

Hence on choosing an ‘object of learning’ “one cannot simply make reference to a set of topics and their places within the content or structure of an academic discipline, such as mathematics.” (Lo and Pong p.15) One must also make reference to the rationale for learning a particular subject matter in terms of how it functions to open up possibilities for the learner to make sense of their lives and their world. Lo and Pong take the learning of ‘fractions’ as an example. They argue that “--instead of taking the learning of ‘fractions’ as a matter of course in the primary curriculum, we should ask stringent questions about the enabling functions that the learning of fractions brings to the learners in making sense of their environment. “ (Lo and Pong p.15)

The concept of ‘the object of learning’ clarifies the relationship between the Hong Kong national curriculum and the tasks of school-based curriculum development. The former depicts the subject matter to be learned and the learning goals related to it, but it does not describe how this subject matter is to be pedagogically handled. That is the task of designing detailed programmes of study. From the standpoint of Variation Theory this is a task for teachers, since they need to establish which critical aspects of the subject matter need to be discerned by learners in the light of their particular difficulties in developing their understanding of a phenomenon. The problem with the English national curriculum from the start was the tendency for the government to centrally prescribe detailed programmes of study and thereby prevent teachers from being responsive to their students’ learning needs.

‘Objects of learning’ can be differentiated according to context. They may be ‘intended’, ‘enacted’ or ‘lived.’ Students do not always learn what is intended. The teacher may enact an ‘object of learning’ in a lesson that does not express the ‘intended object of learning’ before the lesson, and a student may encounter an ‘object of learning’ as a lived experience that was not intended or enacted by the teacher.



## **2. Critical Aspects**

These are critical features of the subject matter that students need to discern in order to acquire the intended capability. By way of example Lo and Pong cite the study of astronomical phenomena in the general studies primary curriculum in Hong Kong (p.17). The students are expected to learn topics like the Four Seasons, Lunar eclipses, Tides, --- rotation and revolution of the Moon and Earth. Lo and Pong argue that without “carefully analysing what the object of learning should be, what the critical aspects are, and how these are related, teachers often feel that they are confronted with, and have to conform to, a curriculum which fails to support learning for understanding”. This is because it appears to present “too many disconnected facts in too short a time”. To help students learn such topics teachers must be able to understand why students may experience difficulties in discerning their critical features. They are likely to approach these topics intuitively from a geocentric perspective “because they can only see the movements of the moon and the sun, but not that of the earth as they are standing on it”. Pedagogically students are required to change their geographical perspective to a heliocentric one. Lo and Pong show how concepts like “gravitational force and how it operates between these celestial bodies resulting in rotation and revolution” are critical aspects of the subject matter that need to be discerned if students are to develop the capability to explain and deduce the astronomical phenomena which feature in the HK general studies curriculum.

## **3. The structure of awareness**

Any phenomenon has different aspects. It can be seen in different ways depending on which aspects are discerned as critical, and this will depend on one’s purposes in relation to it. Learning is the discernment of critical aspects of the subject matter that have not previously been discerned or noticed. (see Lo and Pong p.18)

#### **4. Discernment and Variation**

People notice things when they stand out. “Things tend to stand out when they change or vary against a stable background or when something stays unchanged against a changing background.” e.g. birds in forest are discerned from the same background when they move. Lo and Pong (p.19) state that “-- we must discern all the critical aspects of a phenomenon *simultaneously* in order to gain a complete understanding of a phenomenon.” e.g. the detective weighing up all the evidence may suddenly discern all the critical aspects at the same time so that their relationship becomes clear. To fully understand a phenomenon one needs to discern how the each critical aspect is related to the others and to the whole (p.20).

#### Three kinds of Variation.

Learning Studies in Hong Kong has built Variation Theory into Japanese Lesson Studies through three major projects. The process began on a major scale in 2000, when the Curriculum Development Institute in Hong Kong commissioned research into how to cater for individual differences in students attending mainstream schools. The CDI had just embarked on widespread curriculum reforms following the changeover from British rule. Lo Mun Ling with Ference Marton serving as the main consultant directed this research. It explicitly set out to test the value of using the framework of concepts associated with Variation Theory as a guide to pedagogical/curriculum design. The project worked with a total of 18 teachers groups of teachers supported by 12 academic staff over a three-year period. In the process the framework itself was refined and further tested through the QEF funded PIPS project (2001-2004) and the Education and Manpower Bureau (EMB) funded ‘Variation for the Improvement of Teaching and Learning’ project (VITAL 2003-2007). PIPS engaged volunteer 40 primary schools and VITAL 120 primary and secondary schools in Learning Studies.

Three types of variation were discriminated in assessing the impact of the first project on the teachers involved. These came to be known as V1, V2, and V3.

V1 refers to variation in students' understanding of the subject matter.

V2 refers to variation in teachers' ways of handling the object of learning (topic) in planning a research lesson. e.g. in their discernment of its critical features.

V3 refers to variation as a guiding principle of pedagogical design i.e. the use teachers make of patterns of variation in enabling students to discern critical features of the object of learning.

#### A Pedagogy based on Variation.

From the perspective of Variation Theory teachers are responsible for designing learning experiences that can bring about the discernment needed. (Lo and Pong p.21) Lo and Pong argue that it addresses a gap in lesson preparation that needs to be filled. There is too much emphasis on teaching methods in educational reform.

To cater for individual differences, teachers should (p.25):

- 1) Carefully select worthwhile objects of learning;
- 2) Identify variation in students understanding of the intended object of learning and corresponding critical aspects that present difficulties to students' learning (V1);
- 3) Plan learning experiences to help students focus on these critical aspects by making use of appropriate patterns of variation (V3).

Variation Theory does not provide us with insights into the exact teaching strategies to employ. Lo and Pong argue that it is important to create conditions of motivation in the learning environment and capabilities in relation to general aspects of an

object of learning. There is a need for teachers and academics to collaborate in cycles of learning studies (p.26).

One important justification for learning studies as a form of collaborative action research informed by Variation Theory is that they narrow the achievement gap between low and high achievers and call the need to organise classes according to ability sets into question (see Lo and Marton 2006 p. 147-149).

Lo (2006 p. 139)) argues that Learning Studies, given its impact on learning and in spite of its labour intensive character and the expense involved in carrying them out, are very cost effective if one compares them with the costs of much curriculum reform and its limited impact on learning outcomes.

#### Issues about Learning Studies as a form of action research.

What follows draws on an independent evaluation of the ‘Variation for the Improvement of Teaching and Learning’ (VITAL) project, which this author carried out in Hong Kong over a 3-year period (2003-7) (see page references below from Elliott and Yu 2008). It built on a previous evaluation this author carried out into the PIPS project (2001-4). The VITAL project was sponsored by the HK government and engaged 120 secondary and primary schools in carrying out at least one full Learning Study each. The evaluation involved in-depth interviews with School Development Officers, and Principals, Teachers, and Pupils in a sample of schools plus surveys of Principals’ and Teachers’ perspectives on Learning Study across all the schools involved.

I will focus on two issues that emerged in Hong Kong during the discussions and debates about Learning Studies. The first relates to the exclusive use of Variation Theory as a basis for research-based lesson planning, and the second to the long-term impact of Learning Studies, defined in terms of a time consuming and

resource intensive procedural package, on teaching and learning in Hong Kong.

*To what extent does the aim of systematically testing an educational theory constrain or empower practitioners to develop their practice through research?*

Embedding the use of Variation Theory in Lesson Study may restrict the usefulness of Lesson Study more generally for teachers' research. In addition to peer observation and conferencing the use of Variation Theory also requires the gathering of data about pupil perceptions of the 'object of learning' and the design, administration and analysis of pre- and post- tests. Teacher participation in learning oriented Lesson Study in Hong Kong is therefore heavily dependent upon the commitment of school leaders and their ability to marshal scarce resources, in terms of time and manpower, for this kind of practitioner research. Given such conditions many have questioned whether it can be integrated into the working practices of teachers on a sustainable basis. Even if they are right, one can still ask questions about the long-term impact of this form of resource intensive and procedurally inflexible teacher research on the pedagogical practices of the teachers involved, and compare it with the impact of less resource intensive and more flexible kinds of teacher research.

The main capabilities associated with variation theory in the VITAL Project (p.180) are:

- Understanding variations in the ways students understand the intended object of learning (V1),
- Understanding variations in the way teachers understand and handle the particular object of learning (V2),
- Using V1 and V2 to plan learning experiences, which make use of patterns of variation that, are judged appropriate for enhancing a critical discernment of the object of learning (V3).

In interview members of the core academic support staff were asked to clarify their understanding of the range of applications of variation theory involved in the VITAL Project lesson studies and the extent to which they captured the capabilities teachers need to develop to improve the quality of teaching and learning in their classrooms. In general the core academic staff believed that the project provided all the teachers involved with opportunities to develop the full range of capabilities. However, some academic consultants outside the core group perceived limitations in the usefulness of variation theory as a pedagogical tool in some curriculum areas, such as languages (pp. 180-183).

In responding to the questionnaire survey, 45% of the 232 teacher respondents claimed that they were using variation theory in their daily teaching practice (pp. 183-186). Interestingly the majority of the examples cited were in the area of Mathematics (p.186). The uses of variation theory in the cultural and humanity subjects were rare. The total responses also indicated that teachers' understanding of variation theory was somewhat divergent. However, the 'examples of use' cited were judged by the evaluator and his assistant to indicate a reasonable level of understanding (see pp.186-191).

In using variation theory as a pedagogical tool teachers:

- experience lesson planning as a form of coordinated action;
- observe and discuss each others' practice;
- elicit students' perspectives on lessons.

In one school teachers felt that aspects of variation theory mirrored things teachers were tacitly aware of and served as a reminder to ensure that they were embedded in their practice. Hence, they became incorporated into the teachers' technical repertoire as 'tricks of the trade'. It was certainly regarded by some teachers as a pedagogical tool that enabled them to reflect about the significance

of what is varied and what is held constant in the pedagogical situation for the quality of learning. Viewed from the standpoint of Variation Theory teaching was cast in the form of an experimental science.

There is little doubt that the VITAL Project Learning Studies, informed by Variation Theory, provided a context and space in which teachers were able to reflect on their classroom practice (pp.200-204). They gave teachers an opportunity to reflect about their teaching from the learners' point of view. In addition to using student data from pre and post-lesson tests and interviews, a great deal of information stemmed from informal dialogues and discussions with students during the course of a lesson. This appears to have permanently changed the way teachers viewed and related to students and vice versa, and made them more self-reflexive in their interactions with them. Teachers involved in the VITAL Project now increasingly plan their lessons from the students' perspective.

The VITAL project, according to the questionnaire survey of principals' views, made a significant difference in schools with respect to effecting changes in the professional culture and in the capabilities of teachers (pp.41-43). The vast majority of the respondents (90% 53/60) felt that the project had made a lot of difference. The main difference cited was the development of a collaborative professional culture - cooperative lesson planning, peer observation, and deep discussion of classroom experiences, With respect to the latter some principals clearly associated the quality of the discussions between teachers with them acquiring a language – the terminology of Variation Theory - for talking about and analyzing teaching and learning together. Other differences cited, which can also be linked to the use of Variation Theory, included an enhanced capability on the part of teachers at diagnosing students' misconceptions of the subject matter and the gaps between the teacher's intended object of learning and

students' conceptions of it. Also reference was made to teachers no longer imposing limits on some students' learning potential.

The transference of capabilities acquired through the Learning Study to other lessons was cited as an indicator of impact, but there were some disagreements about the extent to which transference had occurred.

There was considerable overlap between principals' and teachers' perceptions of the impact of the VITAL project in schools (pp.43-47). Both tended to emphasize impact on the professional development of frontline teachers. However, in responding to the questionnaire teachers (159/232) tended to cite the specific capabilities they had acquired in greater detail. These included improvements in subject matter knowledge, in interviewing, research and teamwork skills, in identifying students' learning needs and potential, in 'assessment for learning' capabilities. Also, when asked whether the schools had followed up their involvement in the project with further Learning Studies over half of the teacher respondents said they had. In total these VITAL follow-up studies embraced all the main areas of the new curriculum.

In one interview it was suggested that teachers whose subject knowledge is weak might be frightened of this being exposed if they participated in the VITAL Project. In order for the learning study to strengthen teachers' subject knowledge teachers must experience it as a safe learning environment. The evidence gathered in the course of the evaluation suggests that the vast majority of participating teachers experienced it in these terms.

One of the benefits claimed for Lesson Study is that it links the development of subject knowledge with the development of pedagogical knowledge (pp.192-194). The latter consists of knowledge about the problems students have with learning certain topics, and how pedagogically they can be helped to over-come



them.

The growth in teachers subject and pedagogical knowledge through the VITAL Project was clearly evidenced in teachers' testimony that they now knew how to choose a topic, to plan a lesson around it, and to teach it (pp.175-179).

In spite of the extensive use of pre- and post-tests and the general emphasis on the importance of assessment for learning, teachers' questionnaire responses (232) showed that only 41% claimed that their assessment practice have been influenced by the learning study (pp.195-199). With respect to these teachers, their involvement in a learning study appears to have impacted on both their conceptual and practical understanding of assessment. In addition to pre and post-tests more teachers were using information gathered in conversation with students and via close observation of their performance on learning tasks.

Students' accounts of their learning in the context of a Learning Study were also indicative of their teachers framing their learning experiences according to a Variation Theory perspective. The students interviewed were asked about their experience of the learning process in the VITAL Learning Study and how it differed from their normal learning experiences at school (pp.116-122). Most clearly enjoyed a learning process that they experienced as more active and self-directed than the one they were accustomed to. This partly explains their ability to recall a Learning Study lesson long after it had finished (in some cases two years previously). They were also able to recall a lesson long after the event because the more active/interactive process, which they experienced in relation to the subject matter, generated learning in greater depth, and which was retained in the long-term memory rather than simply being stored in the short-term memory for the mere purpose of passing public examinations.

Learning Study students claimed that they were more able to apply their learning to everyday life (pp.128-133). In particular the learning study appears to have created a stronger linkage between mathematical learning and its usefulness in everyday life (pp.155-156). In one group interview the issue arose about whether this was because the topic was chosen for the learning study in terms of its relevance to daily life or whether any mathematical topic could be taught in a form that enabled students to discern its practical significance.

The impact of a Learning Study on students' learning was perceived by some teachers to be a consequence of teachers having the time to focus together and in detail on teaching a small amount of content (p.159).

On the basis of student testimony the VITAL Project Learning Studies appear to have transformed pedagogy – at least temporarily – in ways that are consistent with the pedagogical aims of the Hong Kong Curriculum Reforms (pp.159-169).

*What is the longer-term impact on schools and classrooms of a resource intensive and relatively inflexible procedural package for practitioner research? (see pp.90-102, pp.244-252)*

Many teachers found that the benefits from a single full-scale Learning Study outweighed the costs in time. They argued that what they learned from the full-scale study could subsequently be applied to their teaching generally in less time consuming and smaller scale Learning Studies. The former tended to be viewed as a significant learning experience that was necessary if not sufficient to improving the effectiveness of their teaching more generally.

Many teachers and their principals did not in the main view the VITAL 'Learning Study' as an integrated component of School-

based Curriculum Development. It tended to be viewed as an intervention that is of value as both an initial and top-up ‘injection of capabilities’ for effecting curriculum and pedagogical change in the school. Such interventions often take place where principals and their staff discern space for change within the organisation.

The costs of a full-scale VITAL Learning Study were perceived to outweigh the benefits when there is little evidence of transference of knowledge and skills (capabilities) into normal practice in classrooms. Most teachers and students appear to have experienced regression back to the previous pedagogical routines, which fell short of total regression. However, many of the teachers - approximately two-thirds of the questionnaire respondents - may well have perceived the benefits of the VITAL Learning Study to have outweighed the costs because they were able to transfer something of the capabilities they had acquired in the process into their normal practice in sustainable forms. The significant minority of questionnaire respondents - approximately one-third - who perceived the costs to outweigh the benefits were perhaps those who felt that they were unable to transfer capabilities from the VITAL Study into normal practice.

#### Concluding Remarks: a way forward for teachers’ research.

Learning Studies was perceived by some teachers and principals to reduce the gap between high and low- achievers in a way that normal practice has not, hence supporting the claim of Lo and Marton 2006 p.147-149) mentioned earlier.

One academic consultant when interviewed felt that any significant reduction in the achievement gap at the whole school level through learning studies would depend upon a significant transformation of the teaching and learning culture within a school through cumulative studies that supported sustainable changes in pedagogy. This points to a further stage in developing the potential of Learning Studies, which has been acknowledged by Lo and her co-workers.

In Hong Kong there is a substantial number of case reports and case data sets that can be assembled as a basis for making cross-case comparisons in relation to a range of specific objects of learning in different learning areas.

Learning Studies in Hong Kong has created the conditions, which Stenhouse outlined as necessary for the systematic and cumulative production of pedagogical knowledge in propositional and actionable form. It has injected into the world of teaching capabilities associated with taking a self-critical stance, a willingness to submit work to the scrutiny of others, and the use of a common vocabulary of concepts and a syntax of theory in which to capture and share insights into teaching and learning. In order to effect long-term sustainable improvements in pedagogical practice Learning Studies need to become the building blocks for systematically organized sets of pedagogical knowledge. If resources can be channeled to constructing these sets then Hong Kong can become, as Ference Marton once predicted, the pedagogical capital of the world.

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