The aim of this book is to bring teacher research to the centre of attention in educational research. Knowledge generated by researching teachers and teacher researchers – often in collaboration with university researchers – identifying new and innovative research methodologies and theories, feeds directly back into theorising practice and the practice of theory that is necessary to improve student learning. This edited volume is unique in that it details diverse teacher research practices and partnerships across a diversity of cultural settings (from Sweden, Turkey, South Africa, Cyprus, Singapore, Hong Kong/China, Australia and the UK). In this volume, 19 internationally acknowledged researchers from nine different countries draw on and develop a new wave of theory and practice for transformative teaching and learning. Themes explored include: contributions of the latest emerging theories and research approaches, types/models of university-school partnerships and teacher research communities which build, change and sustain educational reform, empirical findings and evidence-based benefits from teacher research and professional learning, critical policy research in teacher research, innovative approaches to course designs with an aim to transform understanding of teaching and teacher research.
Transformative Teacher Research
CRITICAL ISSUES IN THE FUTURE OF LEARNING AND TEACHING

Volume 11

Series Editors:

Britt-Marie Apelgren, University of Gothenburg, Sweden
Pamela Burnard, University of Cambridge, UK
Nese Cabaroglu, University of Cukurova, Turkey
Pamela M. Denicolo, University of Surrey, UK
Nicola Simmons, Brock University, Canada

Founding Editor:

Michael Kompf† (Brock University, Canada)

Scope:

This series represents a forum for important issues that do and will affect how learning and teaching are thought about and practised. All educational venues and situations are undergoing change because of information and communications technology, globalization and paradigmatic shifts in determining what knowledge is valued. Our scope includes matters in primary, secondary and tertiary education as well as community-based informal circumstances. Important and significant differences between information and knowledge represent a departure from traditional educational offerings heightening the need for further and deeper understanding of the implications such opportunities have for influencing what happens in schools, colleges and universities around the globe. An inclusive approach helps attend to important current and future issues related to learners, teachers and the variety of cultures and venues in which educational efforts occur. We invite forward-looking contributions that reflect an international comparative perspective illustrating similarities and differences in situations, problems, solutions and outcomes.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>vii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>ix</td>
</tr>
<tr>
<td>List of Figures, Tables, Textboxes and Appendices</td>
<td>xi</td>
</tr>
<tr>
<td><strong>Part 1: Theorising Practice: Practising Theory</strong></td>
<td></td>
</tr>
<tr>
<td>1. Theory-Use in Teacher Research</td>
<td>3</td>
</tr>
<tr>
<td>Britt-Marie Apelgren, Pamela Burnard and Nese Cabaroglu</td>
<td></td>
</tr>
<tr>
<td>2. Learning Theory as a Teaching Resource: Enhancing Students’</td>
<td>13</td>
</tr>
<tr>
<td>Understanding</td>
<td></td>
</tr>
<tr>
<td>Ming Fai Pang, Ference Marton, Li-Xin Cong and Wing-Wah Ki</td>
<td></td>
</tr>
<tr>
<td>3. The Pedagogical Potential of Phenomenography for Teacher Practice</td>
<td>25</td>
</tr>
<tr>
<td>and Teacher Research</td>
<td></td>
</tr>
<tr>
<td>Shirley Booth and Åke Ingerman</td>
<td></td>
</tr>
<tr>
<td>4. Beyond the School Gates Through the Children’s Family Front Doors:</td>
<td>39</td>
</tr>
<tr>
<td>A Teacher-Researcher’s Journey to Theorise Creative Learning</td>
<td></td>
</tr>
<tr>
<td>Practices</td>
<td></td>
</tr>
<tr>
<td>James Biddulph</td>
<td></td>
</tr>
<tr>
<td>5. Writing Down into the Intercultural Difference with Hélène Cixous:</td>
<td>57</td>
</tr>
<tr>
<td>Towards an Ethical and Non-Violent Relationship with the Other</td>
<td></td>
</tr>
<tr>
<td>as Initial Teacher Educators</td>
<td></td>
</tr>
<tr>
<td>Elizabeth Mackinlay</td>
<td></td>
</tr>
<tr>
<td>6. Connecting Leadership, Professional Development and Affect</td>
<td>73</td>
</tr>
<tr>
<td>Steven Watson and Megan Crawford</td>
<td></td>
</tr>
<tr>
<td>7. Engaging with Ebb and Flow in Singaporean Classrooms:</td>
<td>87</td>
</tr>
<tr>
<td>Transforming the Theory and Practice of Formative</td>
<td></td>
</tr>
<tr>
<td>Assessment through Lesson Study</td>
<td></td>
</tr>
<tr>
<td>Wei Shin Leong</td>
<td></td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

## Part 2: Researching Teachers: Teachers Researching

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Researching Teachers: Teachers Researching as Teaching Practice</td>
<td>Pamela Burnard, Britt-Marie Apelgren and Nese Cabaroglu</td>
<td>103</td>
</tr>
<tr>
<td>9.</td>
<td>Promoting Teachers as Reflective Practitioners</td>
<td>Nese Cabaroglu</td>
<td>113</td>
</tr>
<tr>
<td>10.</td>
<td>Cypriot Primary Teacher Research: Changing Practice in Music Lessons through Technology</td>
<td>Chrysovalentini Konstantinou</td>
<td>127</td>
</tr>
<tr>
<td>11.</td>
<td>Pre-Service Teachers’ Intentions to Teach: Developing Understanding through Textual Narratives and Drawings</td>
<td>Dawn Bennett</td>
<td>141</td>
</tr>
<tr>
<td>12.</td>
<td>Teachers’ and Students’ Thinking and Acting on Changes in Language Teacher Education: A Case Study on Policy Implementation and Enactment</td>
<td>Richard Baldwin and Britt-Marie Apelgren</td>
<td>155</td>
</tr>
<tr>
<td>13.</td>
<td>Towards a Teachers’ Professional Discipline: Shared Responsibility for Didactic Models in Research and Practice</td>
<td>Åke Ingerman and Per-Olof Wickman</td>
<td>167</td>
</tr>
</tbody>
</table>

Notes on Contributors                          181
PREFACE

The aim of this book, *Transformative Teacher Research: Theory and Practice for the C21st*, is to bring different teacher research to the centre of attention in educational research. We want to focus on teacher thinking and practice and examine the significance of innovative and creative teaching practices and how they can transform teacher thinking and practice. Knowledge generated by teacher researchers – often in collaboration with university researchers – identifying new and innovative research methodologies and theories, feeds directly back into the type of practice that is necessary to improve the level of student learning.

This edited volume is unique in that it details diverse teacher research practices and partnerships across a diversity of cultural settings (from Sweden, Turkey, South Africa, Cyprus, Singapore, Hong Kong/China, Australia and the UK) that transform teaching. In the book, 19 internationally acknowledged researchers from nine different countries explore and present research on theory and practice of teaching and learning drawing on specific theories for transformative teaching and learning. Themes explored include: contributions of the latest emerging theories and research approaches, types/models of university-school partnerships and teacher research communities which build, change and sustain educational reform, empirical findings and evidence-based benefits from teacher research and professional learning, critical policy research in teacher research, innovative approaches to course designs with an aim to transform understanding of teaching, and teacher education.

The volume is divided into two parts, each with introductory chapters that provide an analytical overview of what follows. In Part 1, the emphasis is on some specific theoretical perspectives related to practitioner and empirical educational research, wherein both theoretical and practical knowledge are conceptualised and significant. The different theories and approaches focus on encounters between the fields of educational research and teaching practice in which academics, teachers, students, head teachers and educational partners work collaboratively to facilitate and promote educational progress and change. The aim of such theories and approaches is to contribute to professional knowledge formation in both the academy and educational fields and provide a bridge between teachers’ research and practice. In Part 2, the focus is on practice and the contributions enter into dialogue with new and existing approaches and applications in collaborative research partnerships. The aim here is to present tools to use in teacher research along with research methods through which questions of practice can be asked and explored.

As editors, we invite you, the reader, to share and engage with us and the authors in the different, and yet similar, teacher research presented in the following chapters. The chapters in this book deliberately reflect and focus on the naming and framing of practices, the methodological frames, methods and research tools that are used
and the ethical dilemmas faced in teacher research where the fieldwork takes place in the teachers’ own classrooms. The context ranges from national, regional and whole school to classroom levels. The chapters outline teacher research practices which involve policymakers, parents, teachers and learners in and across disciplines. The evidence that all teachers can succeed in becoming researchers is shared and evidenced by all contributing authors.
ACKNOWLEDGEMENTS

We would like to thank all of our contributing authors for their work, their willingness to attend to detail and their generosity in sharing examples of practice. We would also like to thank the team at Sense Publishers, in particular, Michel Lokhorst for his support and advice. Thanks are due co-editors Professor Pam Denicolo and Nicola Simmons for their support and encouragement, and to all the teacher researchers we have worked with whom our initial discussion of transformative teacher research stimulated the idea for the book.

We also thank Antía González Ben at the University of Wisconsin-Madison, whose administrative support in the final days of the manuscript preparation was invaluable. We hope that this volume provides a useful resource for all those who work in teacher education and teacher research and that it also stimulates wider discussion of why teacher research matters.

Pamela Burnard, Britt-Marie Apelgren and Nese Cabaroglu
LIST OF FIGURES, TABLES, TEXTBOXES AND APPENDICES

FIGURES

3.1. Screen capture of the simulation, which is constituted by three representations
4.1. Building on sketches, photos and journal entries to establish a visual representation of my research focus
6.1. Action research model for developing, implementing and evaluating professional development
7.1. Conceptual framework of understanding a teacher’s professional learning through the bifocal lens of context and practice
10.1. Research design
10.2. Teachers’ change model
11.1. Point at which pre-service teachers began to think about becoming a teacher
11.2. Teacher identity: ‘I don’t have one yet’
11.3. Student-centred drawing and narrative (‘Me walking around, guiding students’)  
11.4. FIT-Choice model as shown in Watt, Richardson, Klusmann, Kunter, Beyer, Trautwein, and Baumert (2012, p. 793), with study response areas highlighted
11.5. Drawings by thematic group and element (count, multiple choice)

TABLES

3.1. The outcome space of the first study, showing the delimitations between categories of different focus of awareness in terms of the two analytically implied aspects ‘view of the nature of physics knowledge’ and ‘view of learning physics’  
3.2. The outcome space of the second study, showing the delimitations between categories and analysed into four distinct aspects
3.3. Examples of two distinct kinds of variation in the empirical data
4.1. Arts-based approaches to problematising practice
4.2. Bringing theory into practice
4.3. Theorising practice in John’s life at home
7.1. Five key practices of formative assessment. Adapted from Wiliam (2011)
9.1. Overview of course tasks
LIST OF FIGURES TABLES, TEXTBOXES AND APPENDICES

9.2. Changes in student teacher thinking throughout action research projects 120
11.1. Metaphors and narratives illustrating the importance of social utility value 150

TEXTBOXES

4.1. An email correspondence to Cambridge tutor 8th February 2008 42
4.2. Theorising a conversation about a family’s practice 51
4.3. Problematizing, theorising, practising theory as my new practice 53
7.1. Vignettes of adaption of LS in the professional learning of formative assessment 94
8.1. Using reflective journals 105

APPENDIX

7. Individual reflection log (for a research lesson) 99
PART 1
THEORISING PRACTICE: PRACTISING THEORY
INTRODUCTION

Teachers do not work in isolation. Whether in teaching and learning as colleagues, students, researchers, teacher educators or teacher researchers, the teaching profession cannot hide behind either the very theoretical or the very practical. Whether we are talking about higher-order abstractions of theoretical knowledge, theory generating, theory testing, theory verification, theory-free data, theory development, theory and theoretical formulation, theory work is a critical part of teachers’ professional commitment for school improvement. The teaching profession, we know, cannot hide behind old models, concepts that are outmoded, antiquated language or arcane practices. Theory use is central to professional efforts for quality of practice.

Researching in a post-postmodern context, where everything is subject to scrutiny and remains debatable as to what actually transpired, where the focus is on discourse and discursive and regulatory practices, one often hears criticism of methodologies that lead to theory development. We see theory enforcement, theory development and theory generation modes at work in the chapters that follow reflecting a diversity of thinking about theory use, teacher change and teacher research. Researchers who work with teachers, and no less than teacher researchers, contest the nature of some educational theories and their assumed contribution to effective teaching and learning, and all involved have a point of view and an agenda.

But first, for the purpose of putting teachers’ professional self in the context of and centre place in educational research, let us start by citing Guskey (2002, p. 382) writing about professional development and teacher change:

It is important to note that, for the vast majority of teachers, becoming a better teacher means enhancing student learning outcomes. … What attracts teachers to professional development, therefore, is the belief that it will expand their knowledge and skills, contribute to their growth, and enhance their effectiveness with students.

However, it needs to be pointed out that not all teachers attend organised professional development programmes out of ‘attraction’, rather they may feel obliged to attend. Hence, it is wise to make a distinction between mandatory professional development and teachers’ own search and initiative for professional development. The chapters in Part I of this book concern theory that can enhance practice: teaching and learning.
Whether one starts from theory and applies it to practice or starts from practice and applies it to theory, the close connection between the two is a universal topic in education. The aim of this book, and in particular this chapter, is to introduce theories and approaches that contribute to professional knowledge formation in both the academy and educational fields and that may provide a bridge between teachers’ research and practice. We thoroughly believe that when collaborative engagement is evident, then substantial development and learning can emerge. Even though we all may cherish some singular event that has had a huge impact on our understanding of teaching and learning, the dialogue with other teachers and learners as well as the acting, interacting and sharing of teaching/learning experiences has been shown to lead to more stable professional learning. In 1996, Hargreaves wrote about the imbalance between teachers’ knowledge and university-based knowledge stating that this has been an issue for more than 20 years. 40 years on it still is. Drawing on Stenhouse (1975), Hargreaves (1996, p. 118) suggests that:

If systematic inquiry becomes a more integral part of the professional culture of teaching, it will encourage and empower teachers to identify and resolve more of their own school-level problems and create points of engagement and understanding in relation to university-generated educational research.

The idea of teachers questioning and reflecting on their teaching is fundamental to a variety of research approaches in different contexts – as is the case of teaching practice. One of the main objectives with reflection is the possibility for the teacher to distance him/herself from practice: from traditions (in subject/discipline contexts as well as specific school contexts) but also from teaching habits (in practice and in theories) and perspectives (learner and teacher). Yet reflection is not only about distancing and critically questioning professional matters, it is as much about making sense. A century ago, Dewey (1916, p. 95) described this relation between the object of learning and the points of view of the teacher and the learner in the following way:

To the one who is learned, subject matter is extensive, accurately defined, and logically interrelated. To the one who is learning, it is fluid, partial, and connected through his personal occupations. The problem of teaching is to keep the experience of the student moving in the direction of what the expert already knows.

Dewey’s early focus was on the connection between content, teaching and learning, or should we say content, teacher and learner. It was not until the 1970/80s that a substantial amount of research with various perspectives emanated from practice, classrooms and different school settings. Teachers’ collective and professional knowledge processing/researching were taken over by expert researchers – outside the actual practice. The main aim of this book is to illustrate the commonalities as well as the diversity of educational research related to the theory and practice of teaching and learning. This is done by drawing on specific theories for transformative teaching and learning from the contexts of nine different countries spanning the
Throughout this chapter, our aim is to define and highlight some recent theories and common key concepts that unite the different contributions in Part I of this book.

**ACTION RESEARCH AS TEACHER RESEARCH**

One strong orientation in this book is action research in a variety of dimensions. We therefore start by citing Noffke (1997, p. 322), who states that ‘All versions of action research have professional, personal, and political dimensions, but in the various efforts some aspects are more fully articulated, emphasizing things in different ways’. By taking this eclectic stance to action research, we acknowledge the different stances taken by different researchers under the umbrella term of ‘action research’, and, in doing so, also address the different dimensions evident in this book.

Dewey is regarded by many as one of the founding fathers for what has developed into today’s educational action research (especially through his emphasis on teachers’ reflection and active and collaborative participation in school development work). This stance could be seen in the 1970s in Britain, where Stenhouse (1975) and Elliott (1981) conducted research and developmental work in schools together with teachers and teacher researchers with the aim of understanding and changing educational practice. Their work was built on teachers’ experiences in theorizing from their own practice and aimed at transforming their contexts. In addition, it studied data on students’ views of their own learning as well as teachers’ reflections on their teaching and their students’ learning (Elliott, 1991). Rudduck (1991) inspired many by her interest in the transformative potential of pupil voice, pupils’ learning, pupils’ identities, teacher-pupil relationships and school improvement. All of these issues are prominent in today’s educational research.

In Australia, action researchers were inspired by the work of Stenhouse and his colleagues (e.g., Kemmis & McTaggard, 1981; Carr & Kemmis, 1988). Together with national and international colleagues, they developed and refined action research and put the focus on the symbiotic relationship between theory or practice and the emancipatory aspects. As action research has become increasingly widespread in educational research that aims at change and development, so have the different stances and orientations within its tenet. As indicated earlier, a division is made between the professional, the personal and the political dimensions, although the divide is rarely sharply defined and the different orientations are often blended, or as Carr and Kemmis (2009, p. 80) put it:

Are the distinctions between ‘personal’, ‘professional’ and ‘political’ forms of action research sustainable? Perhaps they are no more than distinctions between things put in the foreground and things left in the background – differences of emphasis rather than differences in kind. Might it be the case, however, that all forms of educational action research are simultaneously ‘personal’ and ‘professional’ and ‘political’?
As action research moves outside the school into the society and its people, community issues become central (e.g., McIntyre, 2000). Biddulph’s (Chapter 4 in Part 1) research is an example of the above: it draws on Bourdieu’s theory of class and habitus and discusses ‘othering’ in relation to diversity of experiences in a multicultural inner city context in Great Britain and in relation to students’ different extramural lives.

In line with both the professional and the personal dimensions of action research, Watson and Crawford (Chapter 9 in Part 1) report on an action research project aimed at transforming practice through student-centred changes at a secondary school in England. Central to their research are the concepts of structure (professional) and agency (personal): the physical and notional constraints within a social system and individual thinking and acting. Hence, the theory and approach for professional development they propose connect leadership, professional development and emotion (affect). Reactions to and rejections of change among teachers are sometimes due to their self-efficacy (Bandura, 1997) and the fact that the teachers did not feel at ease with the suggested changes and were not willing to risk failure (Guskey, 2002). Watson and Crawford (p. 82) write: ‘There were, at times, intense emotions. Two teachers expressed anger in response to the expectation’.

In the Conclusion of the Sage Handbook of Educational Action Research, Somekh and Noffke (2009, p. 525) highlight the critical and emancipatory stance of action research stating that ‘action research is culturally embedded practice, taking somewhat different forms in different countries, positioned differently in relation to national manifestations of political oppression or opportunity.’ MacKinlay (Chapter 5 in Part 1) connects to the above-mentioned ‘culturally embedded practice’ when she, through the means of students’ reflective writing, focuses on difference, interculturality and coloniality – and on ‘othering’ – in her class on Indigenous education with initial teacher educators. She concludes that ‘we can only see my/ourselves looking back at ourselves’ and that reflexivity needs to be ‘uncomfortable’.

LEARNING THEORIES IN TEACHER RESEARCH

The other overarching orientation in research theories in this book are learning theories. An internet search for ‘learning theories’ gives around 6 million hits. However, if narrowed down to ‘students’ approaches to learning’ we arrive at what can be the defined scope for this chapter. The focus is limited to learning theories that enhance students’ understanding and teachers’ understanding of students’ learning. Going back 40 years in time, some seminal empirical research by Marton and Säljö (1976) on student approaches to learning, commonly referred to as deep and surface approaches to learning, received much international acclaim. Some years later, Marton developed the learning theory of phenomenography (Marton, 1981) and later the variation theory (Marton & Booth, 1997). The Japanese lesson study (Lewis, Perry, & Murata, 2006) and the Chinese research lesson and learning study
(Pang & Marton, 2003) have likewise received worldwide attention and affirmation in recent years. Those different theories share the focus on students’ learning.

Discussing Schön’s concept of reflection-in-action (1983), emanating out of Dewey’s concept of reflection, and connecting this to phenomenography, Linder and Marshall (2003, p. 278) argue that those perspectives ‘characterize an essential component of the teaching–learning relationship as being about teachers learning about their students learning as they teach’. In accordance with this, Booth and Ingerman (Chapter 3 in Part 1) talk about phenomenography as a way of seeing and a way of working, highlighting the empirical stance of phenomenography and variation theory and their possible use in the practice of education. In short, they argue that through phenomenographic studies in teachers’ own teaching contexts, the focus on students’ learning informs teachers on what and how students understand, which in turn helps teachers to develop and plan their teaching in a varied way to enhance the future learning. Pang and Lo (2012) have described this as a way to professional knowledge and growth related to teachers’ own classroom practice and activities. These iterative circles and relationship are vital for the improvement of teaching and learning or, as Pang and Marton (2005, p. 190) affirm, ‘The best sources of insights about what is critical and what is necessary come from the learners themselves’.

Hiebert, Gallimore, and Stigler (2002) discuss Dewey’s integrative and collaborative classroom teaching and note that there is a lack of accumulated and shared teaching knowledge, at least in the United States. In contrast, the Japanese lesson study and the Chinese research study offer just that. A lesson study is a form of professional learning where teachers work together to plan, observe and collectively find ways to improve the lessons. It is not systematic research even though the results are documented and shared (Pang, Marton, Cong, & Ki in Chapter 2, and Leong in Chapter 7 in Part 1). Leong reports that as many as 48 percent of Singaporean teachers are implementing various adapted forms of lesson studies in their classrooms and many of them are also taking part in huge in-service training for professional learning. He also remarks on the more personal aspects and agency of, and in, teacher development, where noticing and changing practice can be hard for teachers, as belief systems and routinized practices may be deeply rooted in their teaching practice.

By connecting the variation theory to the lesson study approach, Pang and Marton (2003, p. 180) developed the learning study. They argue that there is a gain in this, as a theoretical component of a learning theory might help to enlighten the actual learning that has taken place, and note that:

A ‘learning study’ is a learning study in three senses. First, the students participating in the study are expected to learn about the object of learning and to learn better than they otherwise would have done. Second, the teachers participating in the study are expected to learn about handling the object of
learning, not only the specific object, but the object of learning in general. Third, the researchers participating in the study are expected to learn about how the theory works, because every learning study is based on a particular theory and that theory is put to a test. The learning study is expected to be a bridge between theory and practice and between basic research and developmental work.

Drawing on the many lesson studies, research lessons and learning studies, Pang, Marton, Cong, and Ki (Chapter 2 in Part 1, p. 13) point out that ‘perhaps somewhat surprisingly – hundreds of millions of teachers are involved in research-like activities during substantial parts of every school year’. This is a remarkable and almost inconceivable figure and it serves as a testimonial to the huge amount of praxis research going on in different classrooms every day.

THROUGH THE LIGHT OF IMPORTANT CONSTRUCTS TOWARDS A COMMON GROUND FOR THEORY-USE IN TEACHER RESEARCH

Discussing central constructs of transformative learning, Taylor and Cranton (2013, p. 35) ask for more in depth exploration of fundamental constructs such as ‘experience, empathy, and desire to change’. We could only agree. However, we can also see how those constructs are indeed explored and sometimes deconstructed in the different chapters in the book (not all of them, in all of the contributions, but as central themes in the chapters). Other significant constructs, important for transformative teaching and learning, that the authors bring up are ‘collaborative’, ‘collegiality’, ‘shared professional knowledge’, ‘noticing’, ‘diversity’, ‘culturality’, ‘student-centred’ and ‘iterative approach’. We will look into these concepts and the characterization or burden of ‘proof’ or the verification of knowledge and the problem of sustaining a distinction between the researcher and that which is researched, or in many cases the characterization of the ‘truth’ as constructed by teacher researchers, as in the chapters that follow.

As Popper (1972) convincingly pointed out, no matter how many confirming or verifying instances have been accumulated for a theory to be generated, it is always possible that the next test of prediction will go astray. A claim to knowledge must always stand as provisional in the sense that one can accept the claim only in so far as no one has been able to refute it or demonstrate it is false. And as a consequence of Popper’s work, the idea of confirmation was effectively displaced by the plausible logic of his own theory of falsification. What guides the practice of teacher research is more about blurring the distinction between the researcher and the researched. With theory-use in teacher research, the heart of the matter shifts. With theory-use in teacher research, what is realized is that, apart from research-based teaching (e.g., Elliott, 1981; Stenhouse, 1975), teachers’ research is now being defined as both applied and basic research (e.g., Marton, 2015; Somekh & Noffke, 2009) – ‘proper’ research grounded in practice and based on theory and informed by knowledge and reflections. However, there still is and still will be arguments and disputes on how to define basic research. Traditional and orthodox stances claim that educational
research, being a social science, in general cannot claim to be basic research. Marton (2015, p. 279) refers to Stoke’s (1997) suggestion of ‘use-inspired basic research’, which is defined as both advancing knowledge and being immediately useful, and thereby different from pure ‘basic research’, which is not regarded as immediately useful. Several of the emerging new teacher research theories could accordingly be seen as ‘praxis-related basic research’. In order for teacher research to be considered as basic research, there is a need for collective knowledge bases beyond the particular classroom/schoolyard etcetera, without losing sight of the particular interactions and voices. It is a considerate research community task to allow for such a complex and multifaceted research-base, which allow for both patterns and particularities, that is both context bound and context independent research.

The focus on praxis in both action research and various student learning theories, for example variation theory and phenomenography, and its application in different classrooms around the world through case studies, critical studies, lessons studies and learning studies, is testimony of a common foundation. This is evident in the shared foci on mutuality through ‘collaborative’, ‘collegiality’, cooperation’, ‘shared professional knowledge’. In teacher research, teaching and learning in particular diverse and multicultural contexts is central and affects both research designs and research outcome. However, research has shown that ‘diversity’ and ‘multiculturalism’ can enrich and move teaching and learning in the direction of student-centred teaching and raise an awareness and understanding of others and of other perspectives. Here the use of different theoretical frameworks and research approaches has the potential of functioning as tools for teachers making sense of diversity of experiences, as well as finding structures and intricate relationships and power dynamics. Discussing this, Biddulph (Chapter 4 in Part 1) refers to this stance as a ‘practice of inquiry-driven teaching (and learning)’.

In addition, in a global world, national and international as well as local policies and steering documents may enhance or hinder professional development work. Researchers as well as teachers have to balance between governance and professionalism – between different power relations. Also here, different theories can support teachers in understanding overt and underlying structures in order to be able to act and navigate within structures given. Lundgren (1974) provides one such theory, the theory of frame factors, including both physical and notional constraints (and opportunities) within a school system: the school and its classrooms, local and national rules, procedures and policies, tacit context-bound practices and protocols.

We started this chapter by stating that teachers do not work in isolation. On the contrary, teachers are constantly interacting, not only with students and colleagues, but also with parents, school leaders and other stakeholders. Accordingly, teacher research relates to the complex and sophisticated world of teaching and learning. It concerns power relations, structural and policy issues, but most of all it involves the core of teaching and learning: the student, the teacher and the learning. In spite of underlying research theories or professional development agenda, we observe that creating reciprocal conditions for research enquiries, be it action research
(Noffke & Somekh, 2009) or variation theory (Marton, 2015), sufficient time and space is needed to plan, carry out and evaluate learning to inform teaching. Through a repertoire of research tools and colleagues to share experiences with, there is a potential for transformative learning.

Writing on the relation of theory to practice in the context of action research and practitioner research, Richard Pring (2000, p. 129) argues strongly for a place for theory in the understanding and improvement of educational practice. He says:

To attempt to think about a practice, including an educational practice, as though it is devoid of theory would seem to create an unreal dualism. No practice stands outside a theoretical framework – that is, a framework of interconnected beliefs about the world, human beings and the values worth pursuing, which could be expressed propositionally and subjected to critical analysis. To examine practice requires articulating those beliefs and understandings and exposing them to criticism. Such a critique could be pursued in the light of evidence or conceptual clarification, or the underlying values.

Crucially, and as we have argued in this chapter, teacher research, therefore, and the pursuit of educational policies, is better understood within the system of thought – that is, the theoretical framework – which makes them visible as practices and as policies.

REFERENCES


2. LEARNING THEORY AS A TEACHING RESOURCE

Enhancing Students’ Understanding

INTRODUCTION

Teachers’ research is dealt with in this book. In our chapter we want to point out that — perhaps somewhat surprisingly — hundreds of millions of teachers are involved in research-like activities during substantial parts of every school year. This is called ‘Lesson Study’ (LS) in Japan and ‘Teaching Research Group’ (TRG) in China. We will describe both briefly. We will also describe an attempt to combine LS with a particular theory of learning and teaching (we call it ‘Learning study’) as well as another attempt to combine the same theory with TRG (we refer to this as ‘the Haidian project’). Finally, we will conclude that

• teachers’ participation in the creation of their own professional knowledge through research is likely to contribute to the enhancement of students’ understanding; and
• taking a theory of learning as a point of departure for doing research is likely to enhance the creation of teachers’ professional knowledge.

LESSON STUDY

By publishing their best-selling, The Teaching Gap, Stigler and Hiebert (1999) drew worldwide attention to the Japanese ‘Lesson Study (LS)’ model of enhancing the quality of classroom teaching. They attributed the excellent performance of Japanese students in mathematics to the high-quality teaching in Japanese mathematics classrooms, and attributed the high-quality teaching to the nationally adopted practice of LS.

The Japanese LS is a well-established approach to improving teaching practice that originated in the early 1900s. The term ‘lesson study’ derives from two Japanese words: jugyou which means instruction or lesson, and kenkyu which means research or study. According to Lewis (2000), jugyou kenkyu or ‘lesson study’ refers to the overall process of instructional improvement, whereas if read in reverse, as kenkyu jugyou or ‘research lesson’ (or ‘study lesson’), it refers to the lessons that the teachers collaboratively plan, observe and discuss, the practise of which is a core component of the LS model. As Murata (2011) highlights, lesson studies integrate
many features of effective professional development programmes, in that they are collaborative, classroom-based, practice-oriented, focused on student learning and research-oriented.

According to Saito (2012), there are two major approaches to LS in Japan. With the first approach, the national and regional educational authorities organise an ‘open house lesson study’ for the whole country or a certain region. In the first approach, a teacher is invited to teach a public lesson in the presence of a large group of teachers and educational leaders from different parts of the country or from a certain region. The lesson is based on a lesson plan that is developed by a LS group, and then revised and refined through the LS cycles (usually two). The overall aim is to disseminate exemplary or innovative teaching practices to a wider audience of teaching professionals. The second approach involves local school-based lesson studies in which teachers from the same school work together regularly in groups of five to seven on one or more LS cycles over a period ranging from several months to a year. This approach forms part of the teachers’ professional development; the groups can be formed within subject departments or as a part of an overall school professional learning strategy.

According to Lewis (2002), a LS cycle can be divided into certain key stages. First, the group members discuss and agree upon the learning goals for the research lesson, and then jointly plan the lesson in accordance with the relevant teaching experience of the members of the group and the students’ prior knowledge. One teacher in the group conducts the research lesson while the other team members observe the lesson to collect data on both teaching and learning. Finally, all of the group members collaboratively analyse the lesson and reflect on the ways in which it can be improved in the next cycle of teaching. The aim of this iterative process is to improve the quality of teaching and learning while enhancing teacher professional learning. The LS cycle always concludes with the dissemination of a final report to ensure that the results are widely shared. Overall, the primary concern of the LS is improvement, specifically to improve the quality of classroom teaching to improve student learning. As Lewis (2015, p. 57) argues, ‘Educators choose an improvement aim, agree on how they will recognize improvement, identify the changes that might produce improvement, and test these changes in lesson study cycles.’

LEARNING STUDY AND THE VARIATION THEORY OF LEARNING

The LS model has, so far, mainly been regarded as a form of in-service training or professional development for improving the competence of teachers. However, the participants in a LS are expected to find a better way (than the existing practice) of teaching something specific (e.g., using the ‘-ing’ form of verbs in English) or to try out generalisable ways of arranging learning (e.g., the ‘flipped classroom’). Furthermore, lesson studies are documented and the insights and new knowledge that are created are shared by other teachers. In this sense, lesson studies might constitute a form of research, although they may not always – or perhaps even rarely
LEARNING THEORY AS A TEACHING RESOURCE

– live up to the canons of scientific research. In our view, there are two facets of the LS approach that can be improved: the description of the outcome of learning and the theoretical explanation of why a lesson has worked well or failed to do so. In line with this, a test with non-technical, open-ended questions focusing on the conceptual nature of what is to be learned, administered at the beginning and end of each lesson-cycle, was added to the LS model in a research project in Hong Kong, aimed at finding more powerful ways of ‘catering for individual differences’ among students (Lo, Pong, & Chik, 2005). Furthermore, a theory of learning was included in the analyses of the students’ ways of making sense of the object of learning (what they are supposed to learn) and the content-related interaction in the classroom between the teacher and the students, and between the students themselves.

Based on these modifications, the LS model was transformed into what is known as the ‘Learning study’ model (Lo, 2012; Marton, 2015; Pang & Lo, 2012; Pang & Marton, 2003). Although not specified in the model, the Learning study approach draws on the variation theory of learning, which suggests that learning is regarded as a function of the learners’ experience of differences and similarities (between tasks, examples, illustrations, representations etc.). Novel meanings cannot be appropriated, according to the theory, through the experience of different instances of the same meaning, as the features that constitute it cannot be discerned (e.g., one cannot understand what a linear equation is without coming across a contrasting non-linear equation). The necessary and non-necessary features of linear equations cannot be distinguished without encountering variation in non-necessary features (e.g., the unknowns do not have to be called x or y, you can call them whatever you wish, and numbers do not have to be integers etc.). Neither can the simultaneous differences between linear equations be understood without having encountered the simultaneous variations between them (for instance, p = 61 – q is a linear equation, but so is x = y = 0). The variation theory of learning has been described, elaborated and exemplified by Marton (2015) and Lo (2012). In addition to the characterisation of the theory, there are many examples of how it is applied to teaching in widely varying subjects, in particular in the context of learning studies. The main point of variation theory is that learning is made possible through the combination of tasks, examples, illustrations, representations etc. and, in particular, through the differences and similarities as far as the features of those tasks, examples, illustrations, representations etc. are concerned. This means that in teaching, you have to find out what different students need to understand in order to achieve a particular learning target and find the combination of tasks etc. necessary for doing so. Marton and Pang (2013) summarise some of the main findings about learning studies:

• In nearly all of the existing studies, students’ results are better after the lesson(s) than before (Lo, Pong, & Chik, 2005). (Although this may appear self-evident, it is not. Unfortunately, there are many school lessons in which students learn nothing, or, at least, not what the teacher had hoped they would).
• Students with weaker learning prerequisites usually learn the most. Hence, not only does the average rise, but the spread diminishes (Lo, Pong, & Chik, 2005).

• In cases in which what the students learn is observed not only immediately after the lesson but also on a later occasion, the results are often found to be better at the later time (thus indicating a content-specific ‘learning to learn’ effect) (Holmqvist, Gustavsson, & Wernberg, 2008).

• The results on national achievement tests increased for classes that had participated in several Learning studies, an effect that is likely to have been mediated by changes in the teachers’ regular ways of teaching (Maanula, 2011).

• When the same object of learning is dealt with in a Learning study and in a LS by groups of equally well-qualified teachers, the quality of learning turns out to be strikingly higher for the former approach (Marton & Pang, 2006, 2008; Pang, 2010; Pang & Marton, 2003).

• When the three cycles of a Learning study are compared, the results from the third are usually better than those from the second, and those from the second are usually better than those from the first (Lo, 2009).

The positive effects of Learning studies are most likely in part due to factors shared with the LS approach, such as collegial learning and the careful design of lessons. The observed advantages of Learning studies are likely to stem from two differences between the two similar models. One difference is that a pre-test, focusing on key conceptual features of the object of learning, is used one or several days before the lesson and the students’ answers are carefully analysed and fed into the design of the lesson, as is the theory. Another difference is the main emphasis on the object of learning, which is construed and modified not only on the grounds of the students’ answers to the pre-test, but also on the grounds of the interaction taking place in the classroom as interpreted by the teacher drawing on her theoretical resources. This means that the object of learning, the answer to the question ‘What is to be learned’, is a highly dynamic entity. The teacher’s understanding of it gets more and more precise through her efforts to bring it about.

TEACHING RESEARCH GROUP (教研組)

While the Learning studies in Sweden and Hong Kong are typically organised and coordinated at the individual school level, teachers’ research is seen as a regular part of the work of the teachers and is more institutionalized elsewhere. In China, there is a unique three-tier teaching research structure (i.e., the Teaching Research Offices at the provincial and county/district levels and the Teaching Research Group at the school level), through which teaching research in schools is co-ordinated and organised to improve the quality of teaching and foster teacher professional development (Cong, 2011a). According to Cong (2011b), at both the provincial and county/district level, teaching research offices are established outside schools and
LEARNING THEORY AS A TEACHING RESOURCE

led by a specialised teaching research staff of experienced teachers. They, however, no longer engage in daily classroom teaching; instead they pay regular visits to schools to provide advice and guidance to teachers and conduct teaching research with the teachers in a bid to improve teaching.

The third tier of the system, the TRG, is a basic unit within every primary and secondary school in China which provides a platform for teachers to study teaching and engage in teaching research in a collaborative manner. As stated explicitly in the *Secondary School Teaching Research Group Rulebook (draft)* (Ministry of Education, 1957), ‘A Teaching Research Group is an organization to study teaching. It is not an administrative department. Its task is to organize teachers to do teaching research in order to improve the quality of education, but not to deal with administrative affairs.’

According to Paine and Ma (1993), teachers are organised into different TRGs according to their teaching subjects and a typical group comprises three to seven teachers from a school. The TRGs are integral to the management of schools. When a school principal wants to implement policies or initiate innovations in teaching and learning, he or she will discuss and consult the changes with the appointed heads of TRGs instead of the individual teachers. The TRG is the locus of all teaching activities at a school. In addition to weekly meetings during the school year, the group meets before each school term to discuss and devise the teaching plans and after the school terms to conduct evaluations. Although individual teachers are responsible for enacting the teaching plans in their classrooms, the lesson preparation is conducted in a collective manner. The discussion results are incorporated into the school teaching manuals and the teachers then conduct their lessons in accordance with the agreed plans. Their lessons are observed by other teachers in the TRG, and the teachers attend a post-lesson evaluative meeting to review and reflect on the lesson and identify possible ways for improvement. Occasionally, the lesson observation reports are published to disseminate the results more widely. According to Paine and Ma (1993), TRGs operate in a systematic way to empower individual teachers to contribute to the betterment of the overall teaching quality.

The influence of TRGs at the school level can extend beyond individual schools. For example, expert or master teachers from particular TRGs can reach a wider audience through conducting demonstration lessons organised by the teaching research offices at the provincial and county/district levels. As a result, exemplary teaching ideas and practices can be disseminated to the wider teacher community in a systematic and organised way. In China, the three tiers of the teaching research structure work closely together to promote quality teaching for basic education and are a core component of the basic education system.

THE HAIDIAN (海淀) PROJECT

The LS and the TRG models are both predicated on searching for powerful ways of helping students to achieve particular objects of learning by promoting the careful and joint preparation of lessons and reflection on them. The primary difference
between the two models is that while teachers engage in lesson studies on particular occasions, TRGs provide a framework for teachers’ day to day work. In other words, the TRGs serve as a kind of perpetual LS. Accordingly, if lesson studies are such a good thing (see, for instance, Lewis, 2015), then would it not be better to have them all the time? Recently, a group of researchers, administrators, school leaders and teachers in the Haidian district in Beijing (population three million) trialled a model in which theoretical resources were used, in accordance with the idea of the TRG. Twenty-three schools in four of the 22 sub-districts of Haidian participated in the field experiment, the aim of which was to find more powerful ways of helping students to improve learning while experiencing less pressure. One teacher in each school had the main responsibility for implementing the experiment. The students’ results in several of the schools participating in the experiment had been rather weak previously. Moreover, some of the teachers had difficulty seeing how the topics were understood by the students and some failed to make their teaching interesting and rigorous at the same time. The variation theory of learning was chosen as a tool for achieving the stated aims of the experiment.

There were several reasons for this choice. First, the basic idea of the theory is that novel meanings are appropriated due to the differences that are experienced against a background of sameness, rather than through sameness experienced against a background of variation. This theoretical approach is regarded as a powerful principle of learning largely because variation and invariance are tacit principles of Chinese pedagogy (Chik & Marton, 2010). This pedagogical idea is called ‘bianshi’ (變式) (see, for instance, Gu, Huang, & Marton, 2004). Furthermore, a Learning study model built on variation theory (see above) has been successfully and rather widely used in Hong Kong (Lo, 2012).

Accordingly, in the experiment, variation theory was introduced to the participating teachers through various training workshops. The strategies taken were as follows. First, the school teachers in the project voluntarily participated in the establishment of inter-school TRGs, with each TRG consisting of four to six teachers from different schools. Second, class observation and evaluation activities were developed within the TRGs. The teachers first chose the teaching content and then taught the content according to their original lesson plans. After conducting observations, researchers discussed and deliberated with the teachers regarding their planning and teaching, and used variation theory to analyse the good points of their teaching and the areas for improvement. As a result, the teachers became familiar with variation theory and found that they had already been using variation in their daily teaching, although they had not been aware of it or regarded it as a scientific strategy. After becoming more conscious of the role of variation, the teachers then thought more deeply about the issue, such as when variation should be used, for what key points of learning, and what examples should be chosen and for how long.

Subsequently, the teachers prepared the research lesson together in the TRG. Based on the feedback obtained during the class observation and evaluation
activities, the teachers collectively developed new lesson plans and materials. Finally, the teachers taught the research lessons using the new lesson plan. The above processes were repeated in different schools, for different subjects, at different grades, using different contents. A new kind of activity was also trialled in the project whereby teachers tried out different plans in teaching the same topic and compared the results. The TRGs also provided demonstration and sharing workshops for other teachers.

Four professors from Beijing Normal University (BNU) served as experts in the experiment (The experts included one of the authors of this paper, Li-Xin Cong, and two of the other authors, Ference Marton, and Ming Fai Pang, participated occasionally). According to the final report on the project, the teachers found variation theory to be realistic and useful for improving their students’ learning. All of the research lessons in the different schools were documented and sent to the steering group. The best accounts were selected and attached to the final report. The authors of the report analysed the accounts, evaluated the overall project and explained what effects of the theory they could observe in the accounts of the research lessons. The evaluation was phrased in terms of what effects could be seen rather than how large the effects were, as the research lessons were carried out in different schools, for different subjects, and at different age levels. Thus, it was not possible to comprehensively measure gains in learning. Some of the ways in which the theory influenced the specific research lessons and through them the teachers and students were outlined by the participants:

• The view that transfer is not only a function of sameness, but is also a function of differences (proposed in the variation theory) can likewise be seen as compatible with ‘the Eastern view of learning’ which generally emphasizes the acquisition of holistic insights, through the learner’s experience in working with different situations, trying to achieve balance or connection between the different aspects involved in the situations.

• As variation theory emphasises separating the critical aspects of the object of learning and their logical relations, the theory was seen as representing ‘the Western view of learning’ which generally emphasizes the analytic approach that understanding of something can be enhanced through breaking it into parts. The Project shows that this ‘Western view of learning’ (the variation theory) can actually be brought to complement the ‘Eastern view of learning’ and create harmony.

• Different patterns of variation and invariance were found to be useful in different subjects such as Mathematics, Science, Chinese and English.

• The theory provided teachers with explicit and systematic principles for relating central concepts to each other and for combining different tasks, instances, examples, etc.

• The students’ ways of understanding the object of learning were frequently taken as the point of departure in planning and carrying out the lessons.
To make the points above more concrete, we briefly describe one of the research lessons conducted by Gao and Chen (2013) which was included in the final report of the project. The account was written by one of the teachers in the TRG and one of the participating professors from BNU. In the lesson, the object of learning is the grasping of the ‘quotient unchanged principle’ (the first unit in the Primary four curriculum). It is sometimes used for the expedient calculation of divisions. For example, when given the task of finding the value of 4000 divided by 125, a student may follow the general division algorithm, but could also follow a much smarter method. The secret is as follows: If the student knows that $125 \times 8 = 1000$, then he or she can do an equivalent computation instead of the original one. That is, if we multiply both 4000 and 125 by 8, the result (the quotient) should be the same. So we can simply divide 32,000 by 1000 instead, and the result is 32.

The principle that when both 4000 and 125 (i.e., the dividend and divisor) are multiplied or divided by the same number the resultant quotient will remain unchanged, is called the ‘quotient unchanged principle’ in Chinese primary mathematics textbooks. Its practical value seems to be something that has already been superseded by the electronic calculator. However, knowledge-wise, it is taken by Chinese teachers to be an important principle for gaining a profound mathematical understanding of what division is about. Hence, the choice of this topic also illustrates how the Chinese emphasise the importance of the latter over the former.

Two year 4 classes participated in the study, both taught by a teacher with more than 10 years’ experience in teaching mathematics. The pre-test showed that the two classes were very similar with respect to their background in mathematics. It also showed that the students could easily handle multiplication and division within the same expressions, although many of them had difficulty with seeing directly the equivalence between different expressions. Furthermore, the students found it easier to see that the quotient remained invariant when the dividend and divisor were both expanded by the same number of times, than when they were reduced. In the lesson for the target (‘experimental’) class, these specific weaknesses of the students (and other weaknesses) were systematically addressed by having the students work on tasks the combinations of which brought out variation and invariance in a series of tasks within which the characteristics of the object of learning could be discerned separately and eventually brought together. More or less the same critical characteristics appeared in the tasks provided in the comparison (‘control’) class; however, the variation and invariance were not systematically structured (and hence the awareness of the contrast and generalisation of the critical characteristics was not afforded). Accordingly, almost all of the 28 students in the target class managed to appropriate the object of learning, while only about half of the 28 students in the comparison group did so. The authors concluded:
Guiding students to discern the critical features can help them to develop a better understanding of the principle. …We gained two major insights from the research (1). The different critical features of the principle are connected to the whole. You cannot understand them in isolation. Yet you cannot just talk about them all at once (it is too complicated). This study indicates that the two (the whole and the parts) can be achieved at the same time. You can vary part of the whole and keep the others unchanged. Only with this, can students understand the details and gain a good grasp of the whole picture (2). There is a current trend whereby teachers emphasize concepts and principles in the initial part of learning a topic and fail to sufficiently emphasise the subsequent practice of the skill. That hinders the realisation of the objective of putting the knowledge to use. This study indicates that the application of the principle needs the guidance of the variation theory in helping the discernment of critical features of the application situations, and that can help students to flexibly apply the skills in the future. (p. 322)

IS TEACHERS’ RESEARCH FOR REAL?

As Pang and Marton (2003) note, in both China and Japan there are mechanisms within the school system that call upon teachers to work together on the cycle of planning, implementation, evaluation, revision and dissemination of the ‘research lesson’. Although the procedures for improving teaching practice may vary between the two countries, in both cases teachers work collaboratively to improve their teaching and students’ learning, with the point of departure from the specific objects of learning (or learning goals); the teachers’ involvement and contributions throughout the entire study is highly valued. Furthermore, the collaboration in the Teaching Research Groups and Lesson studies helps teachers to develop a sense of ownership of the teaching plans and jointly developed resources, as the professional and pedagogical decisions are made at a collective level through ongoing discussion and deliberation. Professional knowledge of the subject matter, curriculum and pedagogy is thus shared, which enables teachers to have a better mastery of what and how to teach and to develop a shared vision for the school.

The approach of facilitating teachers’ research through practise seems to work well in Japan and China and is well worth adopting in other countries. However, are the teachers engaging in real research in the same sense that research is conducted in the social sciences in university departments? As far as LS is concerned, steps have been taken to create an international infrastructure, much like that in social science research. An international organisation, the World Association of Lesson Studies, has been created. The Association organises bi-annual conferences and publishes the peer-reviewed *International Journal of Lesson and Learning Studies*. Hopefully, this development will mean that more powerful ways of finding new ways for the betterment of learning will be developed. This is a reasonable
expectation, given that the members of the organisation, the participants at the conferences and the authors of the journal articles are mostly practising teachers. Teacher research is about improving teaching and improving learning, and this improvement requires deep insights into the contexts in which the improvements are required. As education takes place in highly variable contexts, the insights also have to be variable. As Cronbach (1980), Bryk, Gomez, and Grunow (2010) and, more recently, Lewis (2015) have pointed out, improvement research preferably takes place in multiple sites. The relationship between academic research (carried out at universities) and teachers’ research (carried out in schools) is, however, not entirely unproblematic.

Cong (2011a, p. 22) argues that, in the Chinese context, there is a serious threat to TRGs, paradoxically from a greater emphasis on academic research:

Scientific education research involves developing education theories. In other words, the objective is to understand and prescribe educational practices and theorise them into education principles or theories… Scientific education research is similar to other scientific research: it involves formulating hypotheses, determining methodology, collecting data, experimentation, observation, verification and drawing conclusions. The final product is a theory explaining a certain matter. So at the root is discovery. Teaching research is practical. It is an attempt to resolve the question of how to teach… The TRG provides guidance to teachers for solving the pedagogical questions to the extent that the Teaching Research Office aims to improve teaching quality directly and practically. The duties of the TRG are to help teachers prepare, review their teaching methods and introduce the most suitable pedagogy.

The majority of the work carried out in TRG’s has indeed the primary aim of finding powerful ways of helping particular students to appropriate particular objects of learning. And this is highly reasonable, of course. Teachers are not researchers. Teachers are teachers. Still, if there are theoretical tools that can be used in their day to day work – and we certainly believe that there are – it seems a good idea to make use of them in teachers’ practical work. Such theoretical tools cannot have the form of universal prescriptions. Learning and teaching are not very predictable events. The theoretical tools must have the form of frameworks for making sense of students’ varying problems and understandings and for addressing those varying problems and understandings. It is exactly insights of this kind that teachers have – to various extents – as tacit knowledge. Research can make such knowledge shared and explicit. But teachers have to participate in it, in order to be sources of insights and beneficiaries as well. They can do so as a part of their work as teachers, in the same way as Japanese teachers do when they carry out Lesson studies or as Chinese teachers do when they develop ‘public lessons’. And they can use the insights thus acquired together with other teachers teaching the same subjects, in the same way that Chinese teachers do in their Teachers Research Groups (TGR). And when they engage in research, it seems a good idea to engage in theory-based research, in the
same way as many teachers in Hong Kong and Sweden do when they engage in Learning studies.

ACKNOWLEDGEMENTS

Ference Marton wants to express his gratitude to The Royal Society of Arts and Sciences in Gothenburg for financially supporting his participation in the writing of this chapter.

REFERENCES


Maanula, T. (2011). *Resultat från nationella prov i matematik m m* [Results of national tests in mathematics, etc.] (Unpublished manuscript). Retrieved from tuula.maanula@telia.com


Marton, F., & Pang, M. F. (2013). Meanings are acquired from experiencing differences against a background of sameness, rather than from experiencing sameness against a background of difference: Putting a conjecture to the test by embedding it in a pedagogical tool. *Frontline Learning Research, 1*(1), 24–41.

Ministry of Education. (1957). *Zhongxue Jiaoyanzu Tiaoli (Caoan)* [Secondary school teaching research group rulebook (draft)]. Author.


Ming Fai Pang  
The University of Hong Kong  
Faculty of Education  
Hong Kong

Ference Marton  
University of Gothenburg  
Faculty of Education  
Sweden

Li-Xin Cong  
Beijing Normal University,  
Institute of Curriculum and Pedagogy  
Faculty of Education  
China

Wing-Wah Ki  
University of Hong Kong  
Faculty of Education  
Hong Kong