## Conclusion

By comparing with three types proposed by Sherin and Drake (2009), this case study summarizes four types of textbook adaptation, where "addition" is used as a substitute for the idea of "to create", and reorganization is a new type suggested in this study. This study only presents the way the teacher adapts the mathematics textbook in her lesson; the discussion does not include the relation among the adaptation types, the teacher's professionalism, and the quality of the textbook.

Three representations of the textbook which affect teacher's adaptation in this study correspond to curriculum resource mentioned by Brown (2009). However, the four aspects suggested in the teacher's personal knowledge and habit are different from the three teacher resources proposed by Brown. Goals and beliefs (Brown, 2009) are renamed to personal habit and perspective. In addition, knowledge of students' mathematical learning is singled out from mathematics pedagogical content knowledge, not only because it is one of the most recognizable types of knowledge, but because students' learning difficulty requires the teacher's concern and triggers the replacement in perspective drawing activity. The aspects proposed in context are also different from those summarized by Lloyd et al. (2009). Last but not the least, this study makes suggestions on the design of the textbook, teacher training and important aspects of further study.

## 參考文獻

李美穗(2011)。國小數學教師系統專業發展方案建構與實施。載於鍾靜(主編),數學領域輔導團永續經營論文集:分享與傳承(頁31-52)。臺北市:國立臺北教育大學。

[Lee, M.-S. (2001). Construction and implementation of professional development programs for elementary school mathematics teachers. In J. Chung (Ed.), *Proceedings of sustainable management of mathematics advisory group: Sharing and inheriting* (pp. 31-52). Taipei, Taiwan: National Taipei University of Education.]

洪萬生(2003)。青少年的數學概念學習研究——子計畫五:青少年的立

- **體幾何概念發展研究**(行政院國家科學委員會專題研究計畫 NSC91-2522-S-003-001)。臺北市:國立臺灣師範大學。
- [Horng, W.-S. (2003). *Understanding and learning of solid geometry: Junior high school students* (NSC91-2522-S-003-001). Taipei, Taiwan: National Taiwan Normal University.]
- 教育部(2003)。國民中小學九年一貫課程綱要數學學習領域。臺北市: 作者。
- [Ministry of Education. (2003). *Grade 1-9 curriculum guidelines for mathematics learning area*. Taipei, Taiwan: Author.]
- 甯自強(1998)。透過課程發展人員問的形成共識增大兒童的學習機會: 下一步。「國立嘉義師範學院八十六學年度數學教育研討會」發表之 論文。嘉義縣:國立嘉義師範學院。
- [Ning, T.-C. (1998). Expanding children's learning opportunities by forming consensus among curriculum policy-makers, editors and teachers: A next step after development. Paper presented at the Mathematics Education Conference of 1998 at Chiayi Teachers College, Chiayi, Taiwan, Chiayi Teachers College.]
- 甯自強(2000)。數學學習領域之編輯架構。高昇文教資訊,**2**,47-51。
- [Ning, T.-C. (2000). A framework for editing primary mathematics textbooks. *Gao Sheng Educational Information*, 2, 47-51.]
- 翰林出版事業(2010)。國民小學數學五上。臺南市:翰林。 [Hanlin. (2010). *Primary 5 Mathematics*. Tainan, Taiwan: Author.]
- 簡紅珠(2007)。教師專業發展與教學改善:借鏡日本小學教師的學課研究。 教育研究月刊,158,130-140。
- [Chien, H.-C. (2007). Teacher professional development and instructional improvement: Learning from Japanese lesson study. *Journal of Education Research*, 158, 130-140.]
- Ball, D. L., & Feiman-Nemser, S. (1988). Using textbooks and teachers' guides: A dilemma for beginning teachers and teacher educators. *Curriculum Inquiry*, 18, 401-423.
- Brown, M. W. (2009). The teacher-tool relationship: Theorizing the design and use of curriculum materials. In J. T. Remillard, B. A. Herbel-Eisenmann, &

- G. M. Lloyd (Eds.), Mathematics teachers at work: Connecting curriculum materials and classroom instruction (pp. 17-36). New York: Routledge.
- Brown, M., & Edelson, D. C. (2003). Teaching as design: Can we better understand the ways in which teachers use materials so we can better design materials to support their changes in practice? Evanston, IL: The Center for Learning Technologies in Urban Schools.
- Chater, N., Lyou, K., & Myers, T. (1990). Why are conjunctive categories overextended? Journal of Experimental Psychology: Learning, Memory, and Cognition, 16, 497-508.
- Edelson, D. C. (2002). Design research: What we learn when we engage in design. The Journal of the Learning Sciences, 11(1), 105-121.
- Freeman, D. J., & Porter, A. C. (1989). Do textbooks dictate the content of mathematics instruction in elementary schools? American Educational *Research Journal*, 26, 403-421.
- Goodlad, J. I. (1979). Curriculum inquiry: The study of curriculum practice. New York: McGraw-Hill.
- Kaput, J. J. (1991). Notations and representations as mediators of constructive processes. In E. von Glasersfeld (Ed.), Radical constructivism in mathematics education (pp. 53-74). Dordrecht, Netherlands: Kluwer Academic.
- Lloyd, G. M., Remillard, J. T., & Herbel-Eisenmann, B. A. (2009). Teachers' use of curriculum materials: An emerging field. In J. T. Remillard, B. A. Herbel-Eisenmann, & G. M. Lloyd (Eds.), Mathematics teachers at work: Connecting curriculum materials and classroom instruction (pp. 3-14). New York: Routledge.
- Maturana, H. R. (1978). Biology of language: The epistemology of reality. In G. Miller & E. Lenneberg (Eds.), Psychology and biology of language and thought (pp. 27-63). New York: Academic Press.
- Maturana, H. R., & Varela, F. J. (1987). The tree of knowledge: The biological roots of human understanding. Boston, MA: New Science Library.
- Otte, M. (1986). What is a text? In B. Christiansen, A. G. Howson, M. Otte (Eds.), Perspectives on mathematics education: Papers submitted by members of the Bacomet group (pp. 173-203). Dordrecht, Netherlands: Reidel.

- Remillard, J. T. (2005). Examining key concepts in research on teachers' use of mathematics curricula. *Review of Education Research*, 75, 211-246.
- Remillard, J. T., & Bryans, M. B. (2004). Teachers' orientations toward mathematics curriculum materials: Implications for teacher learning. *Journal for Research in Mathematics Education*, *35*, 352-388.
- Sherin, M. G., & Drake, C. (2009). Curriculum strategy framework: Investigating patterns in teachers' use of a reform-based elementary mathematics curriculum. *Journal of Curriculum Studies*, 41, 467-500.
- Stein, M. K., Remillard, J. T., & Smith, M. S. (2007). How curriculum influences student learning. In F. K. Lester, Jr. (Ed.), Second handbook of research on mathematics teaching and learning: A project of the National Council of Teachers of Mathematics (pp. 319-369). Charlotte, NC: Information Age.