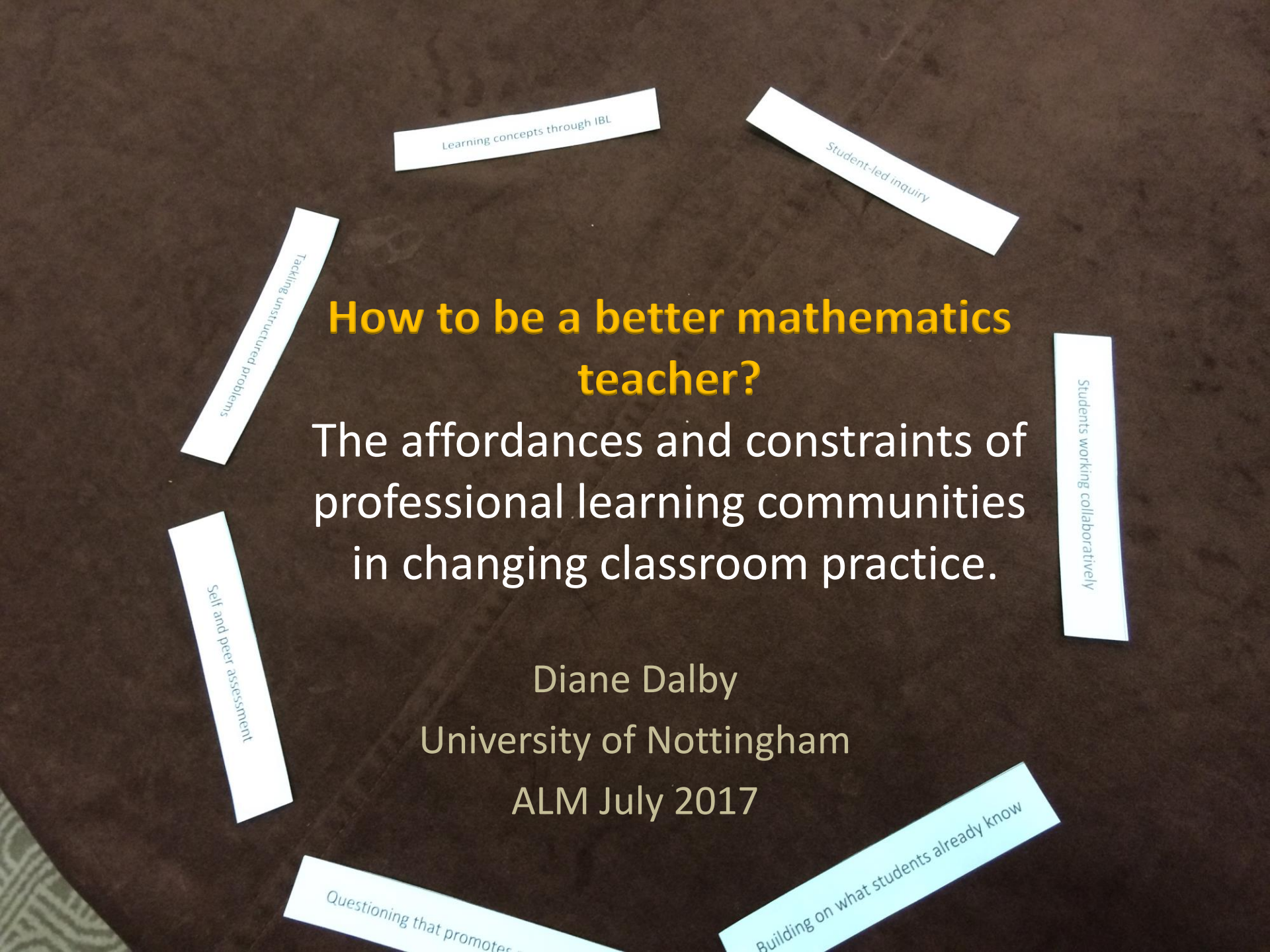


How to be a better mathematics teacher?

The affordances and constraints of professional learning communities in changing classroom practice.

Diane Dalby

University of Nottingham

ALM July 2017

University of Nottingham
UK | CHINA | MALAYSIA

What does it mean to be a 'better' teacher?

- Better 'performance'?
- Greater student satisfaction?
- Increased personal fulfilment?

University of Nottingham
UK | CHINA | MALAYSIA

Professional development

- A process of individual and social change;
- Measures of 'effectiveness' are varied
  - Teacher satisfaction with the PD course?
  - Changes in teacher behaviour?
  - Student outcomes?

  (Timperley et al., 2008; Guskey, 2000)
- Theory alone does not change professional practice; (Cochran-Smith & Zeichner, 2005)

University of Nottingham
UK | CHINA | MALAYSIA

Professional knowledge

Professional practice involves ‘know-how’ rather than ‘know-that’. (Winch, 2013)

Three types of knowledge may be involved in professional development:

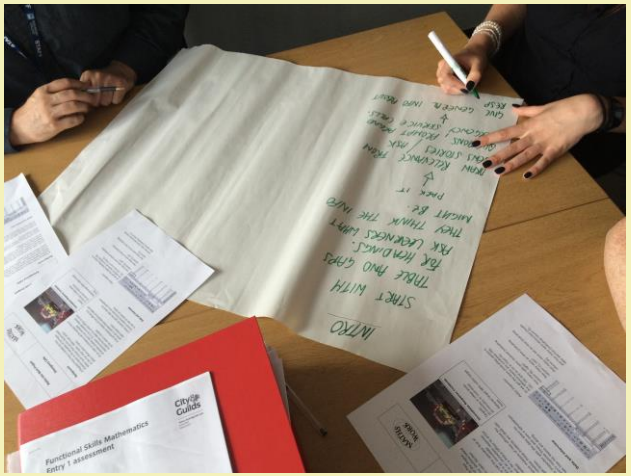
- Knowledge for practice
- Knowledge in practice
- Knowledge of practice.

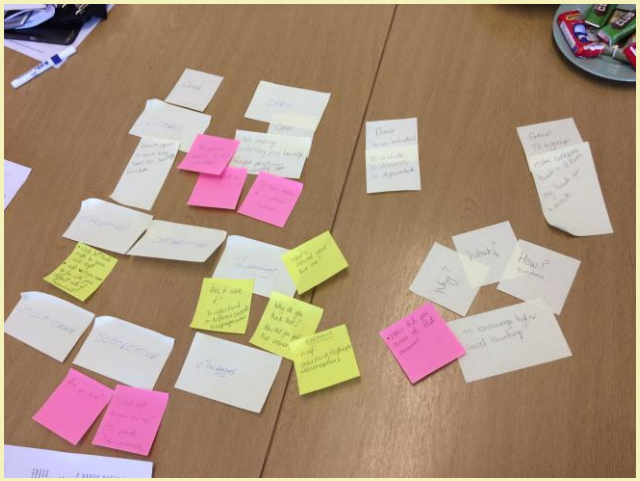
(Cochran-Smith and Lytle, 2001; Dana and Yendol-Hoppey, 2008)

University of Nottingham
UK | CHINA | MALAYSIA

Professional learning

Collaborative teacher learning in professional learning communities (PLCs) is widely viewed as a 'successful' model for sustainable teacher development.
(OECD, 2013; Horn & Little, 2010; Matos et al., 2009)





University of Nottingham
UK | CHINA | MALAYSIA

Professional learning communities

A community of practice

A group of people informally bound together by mutual engagement, shared experience and passion for a joint enterprise.
(Wenger & Snyder, 2000)

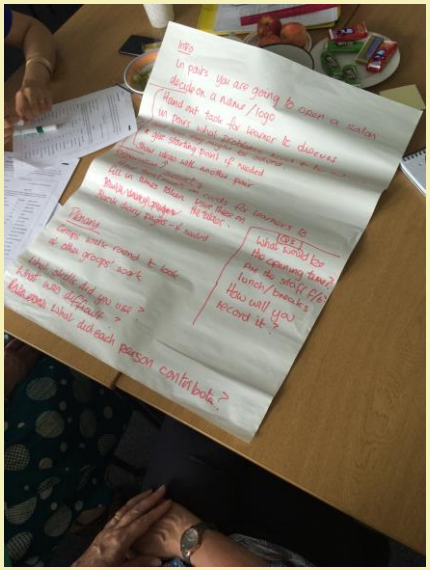
A learning organisation

A school-wide collaborative culture with an orientation towards continuous learning for improvement.
(Senge, 1990)

University of Nottingham
UK | CHINA | MALAYSIA

Features of PLCs

- Shared values
- Collective responsibility
- Collaboration
- Reflection and inquiry
- A focus on group and individual learning
  (Stoll et al., 2006)



Other suggested features:

- The de-privatisation of practice
- A focus on student learning
- Mutual trust and respect.

University of Nottingham
UK | CHINA | MALAYSIA

Case study

- Teachers of mathematics (mainly GCSE and functional mathematics);
- Teaching students from vocational courses in a large Further Education college;
- The teachers are part of a single centralised team and have staff rooms close together;
- The quality and financial performance of the college has been judged as needing improvement.

University of Nottingham
UK | CHINA | MALAYSIA

Teacher case studies

1. What evidence is there of professional learning?
2. What features of a professional learning community are evident?
3. What are the affordances and constraints that exist within this teacher community that might affect classroom practice?

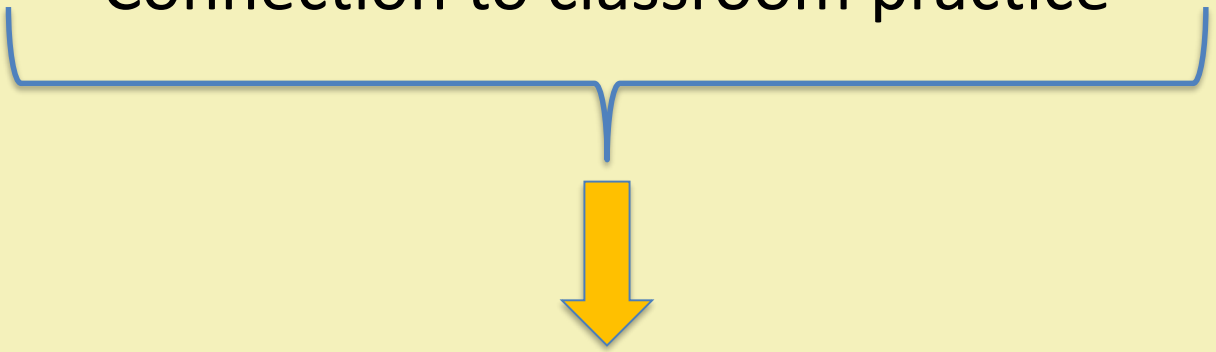
University of Nottingham
UK | CHINA | MALAYSIA

Perceptions of professional development

University of Nottingham
UK | CHINA | MALAYSIA

Affordances and constraints

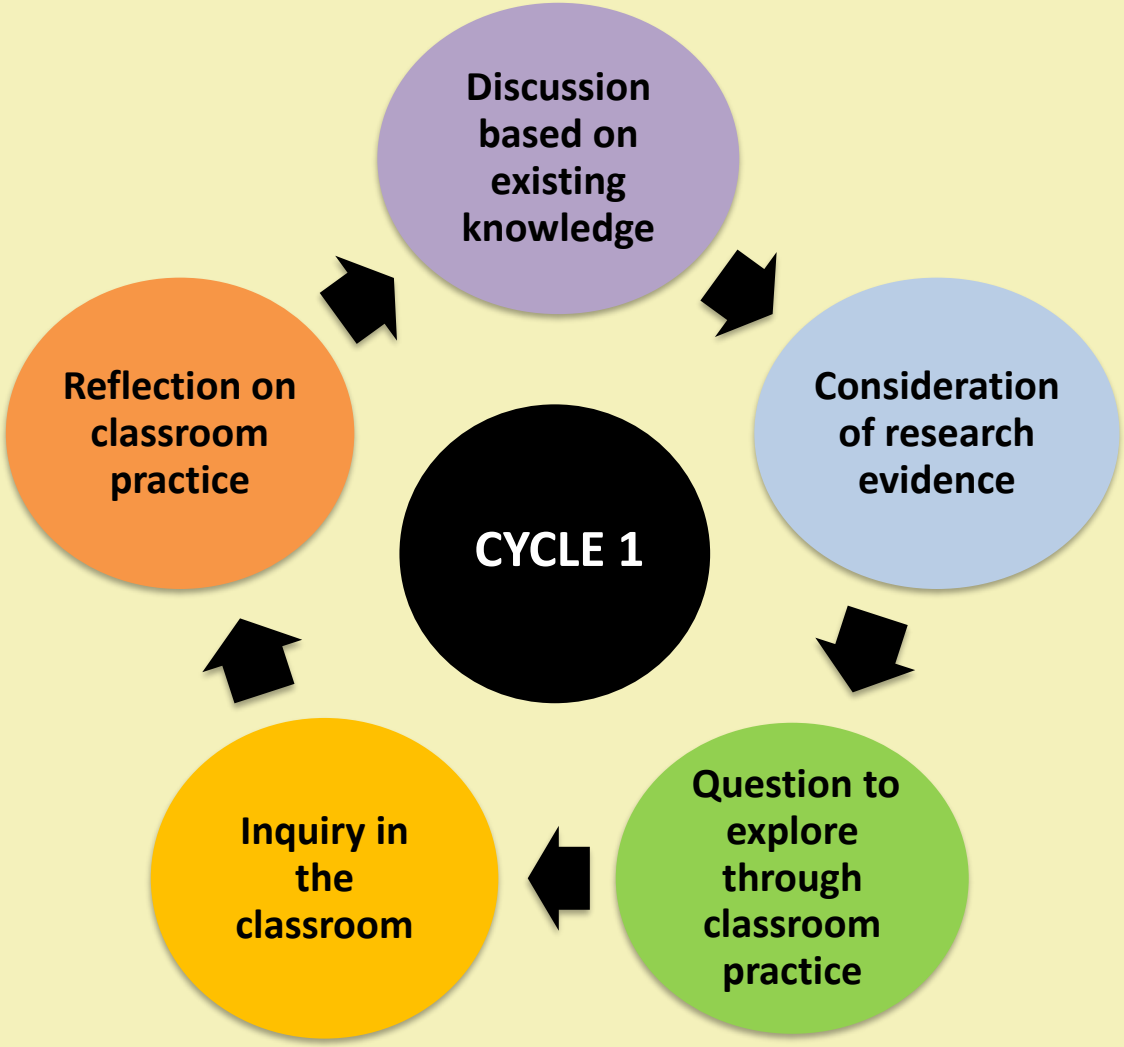
Measures of performance
Changing environment
Policy changes
Fragmented professional knowledge
Connection to classroom practice



Leadership

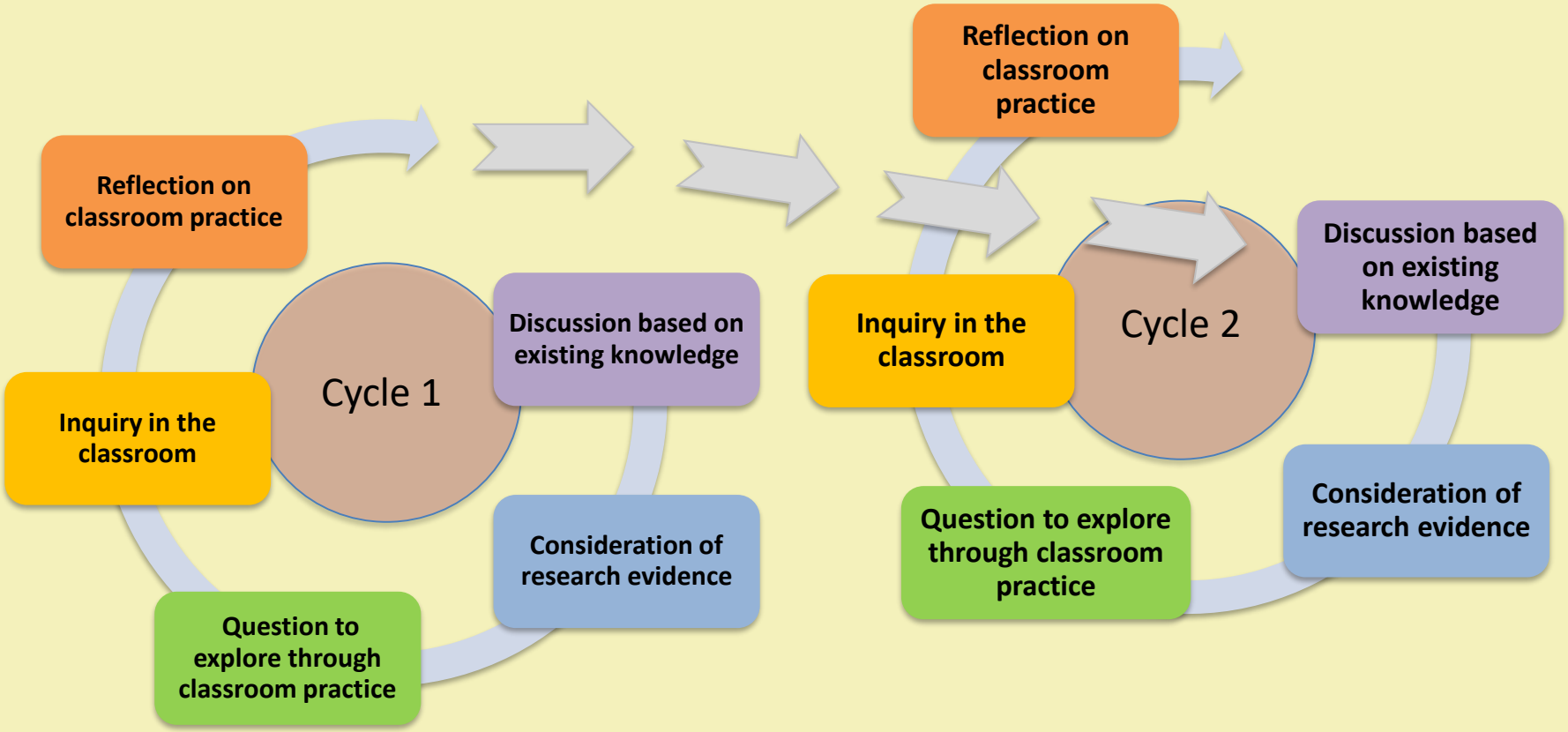
University of Nottingham
UK | CHINA | MALAYSIA

A cycle of inquiry for professional learning



University of Nottingham
UK | CHINA | MALAYSIA

Spiral of inquiry for professional learning



University of Nottingham
UK | CHINA | MALAYSIA

References

Avalos, B. (2011). Teacher professional development in Teaching and Teacher Education over ten years. *Teaching and Teacher Education, 27*(1), 10-20.

Bolam, R., McMahon, A., Stoll, L., Thomas, S., Wallace, M., Greenwood, A., & Smith, M. (2005). *Creating and sustaining effective professional learning communities.* Bristol: University of Bristol, Department of Education and Skills.

Cochran-Smith, M., & Lytle, S. L. (1999). Relationships of knowledge and practice: Teacher learning in communities. *Review of research in education, 24*(1), 249-305.

Cochran-Smith, M., & Zeichner, K. M. (Eds.). (2009). *Studying teacher education: The report of the AERA panel on research and teacher education*. New Jersey: Lawrence Erlbaum Associates.

Dana, N. F., & Yendol-Hoppey, D. (2008). *The reflective educator's guide to professional development: Coaching inquiry-oriented learning communities.* . Thousand Oaks, CA.: Corwin Press.

Guskey, T. R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.

Horn, I. S., & Little, J. W. (2010). Attending to problems of practice: Routines and resources for professional learning in teachers' workplace interactions. , 47(1), 181-217. *American Educational Research Journal, 47*(1), 181-217.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

University of Nottingham
UK | CHINA | MALAYSIA

References (continued)

Matos, J. F., Powell, A., Sztajn, P., Ejersbø, L., Hovermill, J., & Matos, J. F. (2009). Mathematics teachers' professional development: Processes of learning in and from practice. In R. Even & D. L. Ball (Eds.), *The professional education and development of teachers of mathematics* (pp. 167-183). US: Springer.

OECD. (2013). Teaching in Focus: Fostering teacher learning communities.

Peter, S. (1990). The fifth discipline. *The Art & Practice of Learning Organization. Doupleday Currence, New York*.

Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of educational change, 7*(4), 221-258.

Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2008). *Teacher professional learning and development.* Brussels: International Academy of Education.

Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard business review*, *78*(1), 139-146.

Winch, C. (2013). Three Different Conceptions of Know-How and their Relevance to Professional and Vocational Education. *Journal of Philosophy of Education*, *47*(2), 281-298.

University of Nottingham
UK | CHINA | MALAYSIA

Thank you!

diane.dalby@nottingham.ac.uk