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Relationship between teacher capacity of professional learning and teacher self-efficacy: Evidence from structural equation modelling

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Abstract

When equipped with strong professional learning capacity, teachers are capable of enhancing their efficacy in teaching. However, existing research has seldom revealed how teacher capacity of professional learning influences teacher self-efficacy. This study aims to explore the relationship between teacher capacity of professional learning (TCPL) and teacher self-efficacy (TSE). A convenience sampling methods was used in this study to collect data. Structural equation modelling was employed to analyse and validate the relationship between TCPL and TSE. Results show that teacher professional consciousness positively predicted teacher engagement in experimentation. Teacher professional consciousness positively predicted teacher professional reflection. Teacher engagement in experimentation positively predicted teacher professional reflection. Teacher professional reflection positively influenced TSE. Teacher professional consciousness indirectly predicted TSE through professional reflection. Teacher engagement in experimentation indirectly predicts teacher self-efficacy through professional reflection.

Keywords: Teacher capacity, professional learning, professional consciousness, professional reflection, engagement in experimentation, self-efficacy.

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1. Introduction

The effectiveness of an educational institution to sustainably promote students' development is largely determined by the professional qualities of teachers (Barth, 1990; Hargreaves, 1994; Lee, Zhang & Yin, 2011). It has been widely recognised that when equipped with strong professional learning capacity, teachers are capable of creating opportunities of professional growth, refining knowledge base continuously and enhancing their efficacy in teaching (Kelly, 2006; Lai, Li & Gong, 2016). However, existing research has seldom revealed how teacher capacity of professional learning (TCPL) has effects on teacher self-efficacy (TSE). Self-efficacy is an important professional quality for teachers to initiate action, act upon persistence and overcome teaching setbacks (Bandura, 1977; Tschannen-Moran & Hoy, 2007). So, there is a need to explore and identify the potential effects of TCPL on TSE.

2. Theoretical framework and hypothesis

An increasing number of research calls for transformation of the traditional teacher development paradigm which treats teachers as passive learners into 'professional learning' which emphasises the agentic power of teacher professionals in initiating, developing and sustaining learning activities (e.g. Putnam & Borko, 2000; Webster-Wright, 2009). As Webster-Wright (2009) put it, the authentic learning of professionals centres on 'who the professionals are' and 'what the professionals actually know'. This indicates that authentic teacher learning depends on the professional consciousness of teachers to self-directed and motivated to conduct learning activities as well as the professional competences that enable teacher continuously to construct meanings and knowledge in ways of reflection, experimentation and social interaction (Kolb, 2014; Lai et al., 2016; Liu, Hallinger & Feng, 2016). Based on prior research, TCPL was defined as constellations of teacher knowledge, actions and dispositions that manifested in teachers' consciously developing teaching and learning, critically conducting reflective practices and continuously experiment with new ideas, strategies and methods (Lai et al., 2016). Based on relevant research on TCPL (e.g. Kolb, 2014; Liu et al., 2016; Webster-Wright, 2009), this study constructed the conceptual framework of TCPL in which professional consciousness, professional reflection and engagement in experimentation comprise theoretical contents of teacher professional learning competency.

Dimensions of TCPL are interconnected with each other. Teacher professional consciousness is the motive to sustain actions of teacher learning and stimulates teacher professional growth. Through the exercise of the professional consciousness, teachers are self-motivated to engaged themselves in updating their instructional practices, try out new teaching philosophy and apply useful teaching strategies in teaching practice (Bandura, 1999; Moll, Amanti, Neff & Gonzalez, 1992). Based on the argument above, we propose the first hypothesis of this research:

H1: Teacher professional consciousness positively predicts teacher engagement in experimentation.

Research has revealed that with the enhancement of teacher professional consciousness, teachers are more committed to carrying out the educational goals in ways of proactively reflecting on past teaching experiences and modifying their current teaching practices in a recursive way (Liu et al., 2016). Professional consciousness is the information foundation for teachers' reflecting on the thinking processes and actions (Bandura, 1999). With a high level of professional consciousness, teachers are more energised to conduct professional reflection to continuously improve work performance. Therefore, we propose the second hypothesis:

H2: Teacher professional consciousness positively predicts teacher professional reflection.

Through proactive engagement in experimentation, teachers are capable of transferring what they have known to the settings in which their knowledge, skills and dispositions are also continuously refined (Daley, 2000; Putnam & Borko, 2000). The experiences of experimenting new ideas, methods

and skills in processes of teaching attributes to teachers' evaluation of the effects of their instructional practices, and offers teachers opportunities to pursue and reflect on the meanings of their practices (Kolb, 2014). As such, the third hypothesis of this study is proposed:

H3: Teacher engagement in experimentation positively predicts teacher professional reflection.

The proposed theoretical framework in this study was built on prior research (e.g. Beauchamp, Klassen, Parsons, Durksen & Taylor, 2015; Daley, 2000) on TLC and teacher self-efficacy (TSE) to inform the research hypothesis in this study. To increase TCPL is conducive to promote teachers' competences in developing and conducting activities of reflective dialogue and collaborative learning, so as to continuously improve learning and teaching practices (Zhang & Pang, 2016). The enhancement of teacher professional competences contributes to teachers' positive judgement of their abilities in dealing with teaching tasks, which helps teachers form sense of efficacy (Tschannen-Moran et al., 1998). Reflective practices as an important component of teacher competences that enable teachers to systematically analyse the teaching experiences and systematically assess the improvement they can make for change of teaching and learning (Braun & Crumpler, 2004), which has positive influence on teacher efficacy (Colton & Sparks-Langer, 1993). Besides, research has revealed that with a higher level of professional reflection, teachers have more opportunities to cope with teaching difficulties, and gradually deepen their understandings of curriculum, teaching and student management (Marcos, Miguel & Tillema, 2009). The professional reflection of teachers increases the chances of teachers acquiring the master experiences, which is a salient source for teacher self-efficacy (Yost, 2006). Therefore, the fourth hypothesis of this study is proposed:

H4: Teacher professional reflection positively predicts teacher self-efficacy.

Base on the hypothesis proposed above (i.e., H2, H3, H4), teacher professional consciousness and teacher engagement in experimentation is likely to predict teacher self-efficacy through the mediating effects of teacher professional reflection. The fifth and sixth hypothesis of this study is proposed:

H5: Teacher professional reflection mediates the relationship between teacher professional consciousness and teacher self-efficacy.

H6: Teacher professional reflection mediates the relationship between teacher engagement in experimentation and teacher self-efficacy.

3. Research methods

3.1. Participants

Convenience sampling was employed to conduct questionnaire investigation in March, 2016. A total of 172 primary and secondary teachers were investigated and 151 valid questionnaires were finally identified in this study. The valid sample consisted of 104 female teachers (68.9%) and 47 male teachers (31.1%), with 30 (19.9%) primary teachers, 64 (42.4%) lower secondary teachers and 57 (37.7%) upper secondary teachers. Among them, 87 (57.6%) had teaching experiences of no more than 5 years and 64 (42.4%) had taught for more than 5 years. The teachers taught diverse subjects such as physics (34, 22.5%), Chinese language (19, 12.6%), chemistry (19, 12.6%), English language (18, 11.9%), math (14, 9.3%), history (14, 9.3%) etc.

3.2. Instruments

Through referring to prior research or borrowing items from existing questionnaires (e.g. Kwakman, 2003; Liu et al., 2016; OECD, 2014), we created the 6-point Likert-type scale of TCPL ranging from 'strongly disagree' to 'strongly agree'. The TLC scale (Cronbach's $\alpha = 0.90$) in this research comprised three subscales with good reliability, namely subscale of professional consciousness (Cronbach's $\alpha = 0.84$), subscale of professional reflection (Cronbach's $\alpha = 0.75$) and subscale of

teacher experimentation (Cronbach's $\alpha = 0.78$). The TSE scale consisted of four subscales (i.e., efficacy in classroom management, efficacy in instruction and efficacy in student engagement) was 4-point Likert-type scale ranging from 'Strongly disagree' to 'Strongly agree'. The TSE scale was adapted from the one used in Teaching and Learning International Survey (OECD, 2014) with good reliability (Cronbach's $\alpha = 0.84$) and sound validity ($\chi^2/Df = 0.876$, CFI = 1.00, NFI = 0.97, RMSEA = 0.00).

3.3. Data analysis

Structural equation modelling (SEM) was employed in this study to analyse and validate the relationship between teacher professional learning competency and TSE.

4. Findings and results

4.1. Descriptive statistics and correlations

Table 1 shows the results of descriptive analysis and correlations of the factors in this study. Among the three TCPL factors, teacher engagement in experimentation had relative high scores (Mean = 5.10, SD = 0.66), and teacher professional consciousness had relative low scores (Mean = 4.83, SD = 0.84). The three TSE factors almost had the same scores while teacher efficacy (Mean = 3.26, SD = 0.55) has the highest standard deviation, which means that there was a relative larger deviation among teachers' efficacy in classroom management.

Table 1 also displays the correlations of all factors. Teacher gender did not correlate with any factors of TCPL and TSE significantly. Teacher teaching experiences was found to correlate with teacher engagement with experimentation ($r = 0.20$), and teacher efficacy in instrument ($r = 0.17$) and efficacy in classroom management ($r = 0.19$). High correlations were found among three factors of TCPL and also, among three factors of TSE. Positive correlations also existed between TCPL factors and TSE factors.

Table 1. Descriptive statistics and correlation matrix

	Mean	SD	1	2	3	4	5	6	7	8
<i>Background</i>										
1. Gender	0.69	0.46	1							
2. Teaching experiences	7.52	7.7	-0.11	1						
<i>TCPL</i>										
3. PC	4.83	0.84	0.00	0.09	1					
4. PR	4.99	0.75	0.07	0.07	0.77**	1				
5. EE	5.10	0.66	-0.10	0.20*	0.64**	0.64**	1			
<i>TSE</i>										
6. IN	3.21	0.48	-0.09	0.17*	0.45**	0.49**	0.60**	1		
7. SE	3.21	0.50	0.00	0.15	0.45**	0.49**	0.50**	0.59**	1	
8. CM	3.26	0.55	-0.03	0.19*	0.28**	0.37**	0.45**	0.48**	0.53**	1

* $p < 0.05$, ** $p < 0.01$

PC professional consciousness, PR professional reflection, EE engagement in experimentation, IN efficacy in instruction, SE efficacy in student engagement, CM efficacy in classroom management

4.2. Structural equation model analysis

The purpose of this study is to examine the relationship between three components of TCPL, and further explore the relationship between TCPL and TSE. SEM model was constructed using the second-

order factor structure of TSE. The model-fit indices ($\chi^2/Df = 1.49$, CFI = 0.98, NFI = 0.94, NNFI = 0.97, RMSEA = 0.057) indicate that the model had a sound data fit (Hu & Bentler, 1999).

Figure 1 shows the results of the SEM model. Teacher professional consciousness positively predicted teacher engagement in experimentation ($\beta = 0.81$, $P < 0.001$). Teacher professional consciousness positively predicted teacher professional reflection ($\beta = 0.41$, $P < 0.001$). Teacher engagement in experimentation positively predicted teacher professional reflection ($\beta = 0.62$, $P < 0.001$). Teacher professional reflection positively influenced TSE ($\beta = 0.74$, $P < 0.001$). Teacher professional consciousness indirectly predicted TSE through professional reflection ($\beta = 0.30$, $P < 0.001$). Teacher engagement in experimentation indirectly predicts teacher self-efficacy through professional reflection ($\beta = 0.46$, $P < 0.001$). There is no significant direct relationship between teacher professional consciousness and engagement in experiment and TSE.

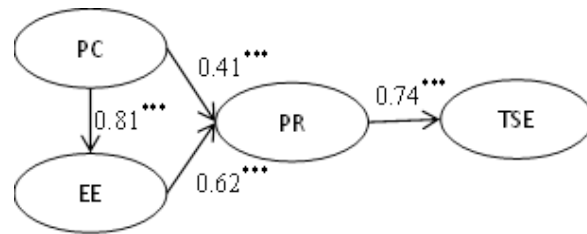


Figure 1. The results of the SEM model (before controlling for teacher background variables)

In order to examine whether the relationship between TCPL and TSE was influenced by teacher backgrounds, another SEM model that controlled background variables of teacher gender (female vs. male) and teaching experiences (number of teaching years) was constructed. The model yielded a sound data fit ($\chi^2/Df = 1.45$, CFI = 0.97, NFI = 0.93, NNFI = 0.96, RMSEA = 0.055). Figure 2 illustrates that female teachers had higher level of professional reflection than male teachers ($\beta = 0.13$, $P < 0.01$). There were no significant gender differences in teacher professional consciousness and teacher engagement in experiment. Teacher teaching experiences can only positively predicted teacher engagement in experimentation ($\beta = 0.17$, $P < 0.01$). After controlling for teacher backgrounds, the relationship between TCPL and TSE remains almost the same.

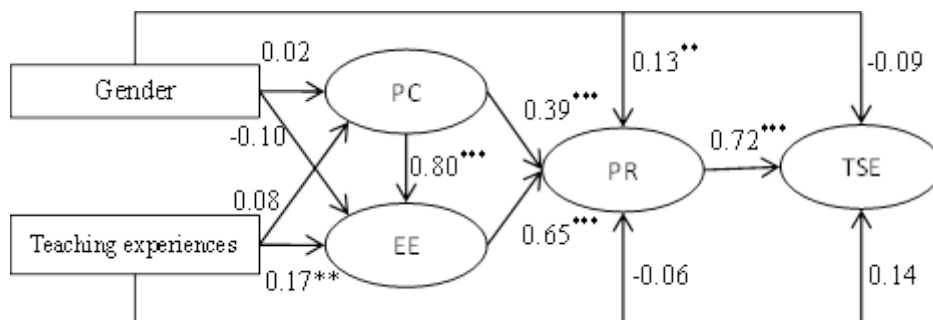


Figure 2. The results of the SEM model (after controlling for teacher background variables)

5. Discussion and conclusion

In this study, we explored the conceptual framework of TCPL, and further examined the relationship between three components of TCPL with teacher self-efficacy. The results of data analysis indicate that the strengthening of teacher professional consciousness led to the enhancement of teachers' competences of professional reflection and teachers' engagement in experimentation. This means that teachers have potentials in initiating and stimulating their own professional awareness in professional development and professional learning, which further improving teachers' competences of professional reflection. The research further unveiled the underlying mechanism in which TCPL

influences TSE. It was found that teacher professional consciousness and teachers' engagement in experimentation positively predicted teacher self-efficacy through the mediating effects of teacher professional reflection. It implies that teachers' exercising of professional agency and their practices of experimentation can lead to the change of their efficacy through the improvement of their reflective practices. This finding is consistent with the cognitive processing of teacher efficacy (Tschannen-Moran & Hoy, 2007), through which teachers can form positive judgement concerning their teaching competence (Wang, Li, Tan & Lee, 2017).

Therefore, we suggest teachers should actively extend their own knowledge base and learn to shape their professional consciousness towards professional learning. As teachers' engagement in experimentation is conducive to teachers' reflective practices, more measures (e.g. setting up teacher role models, creating facilitative school climate and implementing appraisal for teacher experimentation) can be carried out by schools to help teachers better experiment with new ideas, strategies and methods. Besides, teachers' competence of professional reflection should be simultaneously cultivated in order to promote teacher efficacy. Moreover, educational administration department and schools should give more attention to help, support and guide teachers to develop capacity for professional learning and teacher efficacy, rather than just training teachers passively regardless of teachers' background, personal competences and experiences.

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References

- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191.
- Bandura, A. (1999). Social cognitive theory: an agentic perspective. *Asian Journal of Social Psychology*, 2(1), 21–41.
- Barth, R. S. (1990). *Improving schools from within: teachers, parents, and principals can make the difference*. San Francisco, CA: Jossey-Bass Inc., Publishers.
- Beauchamp, L., Klassen, R., Parsons, J., Durksen, T. & Taylor, L. (2015). *Exploring the development of teacher efficacy through professional learning experiences*. Edmonton, AB: Alberta Teachers' Association.
- Braun, J. A. & Crumpler, T. P. (2004). The social memoir: an analysis of developing reflective ability in a pre-service methods course. *Teaching and Teacher Education*, 20(1), 59–75.
- Colton, A. B. & Sparks-Langer, G. M. (1993). A conceptual framework to guide the development of teacher reflection and decision making. *Journal of Teacher Education*, 44(1), 45–54.
- Daley, B. J. (2000). Learning in professional practice. *New Directions for Adult and Continuing Education*, 2000(86), 33–42.
- Hargreaves, A. (1994). *Changing teachers, changing times: teachers' work and culture in the postmodern age*. New York, NY: Teachers College Press.
- Hu, L. T. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), 1–55.
- Kelly, P. (2006). What is teacher learning? A socio-cultural perspective. *Oxford Review of Education*, 32(4), 505–519.
- Kolb, D. A. (2014). *Experiential learning: experience as the source of learning and development*. Upper Saddle River, NJ: FT Press.
- Korthagen, F. A. (2010). Situated learning theory and the pedagogy of teacher education: towards an integrative view of teacher behavior and teacher learning. *Teaching and Teacher Education*, 26(1), 98–106.

Huang, L. & Pang, N. S.-K. (2018). Relationship between teacher capacity of professional learning and teacher self-efficacy: Evidence from structural equation modelling. *New Trends and Issues Proceedings on Humanities and Social Sciences* [Online]. 5(1), 141-147. Available from: www.prosoc.eu

- Kwakman, K. (2003). Factors affecting teachers' participation in professional learning activities. *Teaching and Teacher Education*, 19(2), 149–170.
- Lai, C., Li, Z. & Gong, Y. (2016). Teacher agency and professional learning in cross-cultural teaching contexts: accounts of Chinese teachers from international schools in Hong Kong. *Teaching and Teacher Education*, 54, 12–21.
- Lee, J. C. K., Zhang, Z. & Yin, H. (2011). A multilevel analysis of the impact of a professional learning community, faculty trust in colleagues and collective efficacy on teacher commitment to students. *Teaching and Teacher Education*, 27(5), 820–830.
- Liu, S., Hallinger, P. & Feng, D. (2016). Supporting the professional learning of teachers in China: does principal leadership make a difference? *Teaching and Teacher Education*, 59, 79–91.
- Marcos, J. J. M., Miguel, E. S. & Tillema, H. (2009). Teacher reflection on action: what is said (in research) and what is done (in teaching). *Reflective Practice*, 10(2), 191–204.
- Moll, L. C., Amanti, C., Neff, D. & Gonzalez, N. (1992). Funds of knowledge for teaching: using a qualitative approach to connect homes and classrooms. *Theory into Practice*, 31(2), 132–141.
- OECD. (2014). *Talis 2013 results: an international perspective on teaching and learning (TALIS)*. OECD Publishing. Retrieved from <http://dx.doi.org/10.1787/9789264196261-en>
- Putnam, R. T. & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, 29(1), 4–15.
- Tschannen-Moran, M. & Hoy, A. W. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and Teacher Education*, 23(6), 944–956.
- Wang, L. Y., Li, J. Y., Tan, L. S. & Lee, L. (2017). Contextualizing teacher efficacy in a high-performing system: a research agenda. *British Journal of Educational Studies*, 65(3), 385–403.
- Webster-Wright, A. (2009). Reframing professional development through understanding authentic professional learning. *Review of Educational Research*, 79(2), 702–739.
- Yost, D. S. (2006). Reflection and self-efficacy: enhancing the retention of qualified teachers from a teacher education perspective. *Teacher Education Quarterly*, 33(4), 59–76.
- Zhang, J. & Pang, N. S. K. (2016). Exploring the characteristics of professional learning communities in China: a mixed-method study. *The Asia-Pacific Education Researcher*, 25(1), 11–21.