Exploring the relationships among teaching Chinese as a second language teachers' teaching beliefs, perceptions of Technological Pedagogical Content Knowledge (TPACK) and teaching self-efficacy

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Abstract: The main purpose of this study was to explore teachers' teaching beliefs, perceptions of Technological Pedagogical Content Knowledge (TPACK) and their teaching self-efficacy. A total of 200 teaching Chinese as a second language teachers (TCSL) of Taiwan were participants in this study for the data collection. In this study, three questionnaires were used, including teacher's teaching beliefs, the teachers' perceptions of Technology-related Pedagogical Content Knowledge (TPK/TCK/TPCK) and teachers' teaching self-efficacy. As a result, the confirmatory factor analysis showed that the three questionnaires used in this study were valid and reliable. Besides, according to path analysis, the result indicated that the teachers with constructivism belief tended to have more perceptions of all the Technology-related Pedagogical Content Knowledge; on the contrary, the teachers with traditional belief showed that they tended to have fewer perceptions toward TPCK. Furthermore, it was found that teachers' TPK could positively predict all of their teaching self-efficacy; their TPCK could positively predict their subject content self-efficacy and their TCK can positively predict their Teaching outcome expectancy. All in all, there was a positive relationship between TCSL teachers' constructivism belief and their Technology-related Pedagogical Content Knowledge. Cultivating TCSL teachers' constructivism belief was suggested in TCSL teacher development for enhancing their perceptions of TPACK and their teaching self-efficacy.

Keywords: TCSL teacher, Teaching belief, TPACK, Teaching self-efficacy

1. Introduction

With growing enthusiasm for learning the Chinese language, Chinese learners and teachers of Teaching Chinese as a Second Language (TCSL) were increasing. When we mentioned the integration of technology into teaching, we would associate the concept with TPACK. Following TPACK structural model, it emphasized teachers' ability of using technology and related to Pedagogical Content Knowledge. Teachers would integrate technology into their teaching to improve the quality of teaching and enhance students' learning outcomes. However, in this study, the main purpose was to explore the relationships among teaching Chinese as a second language teachers' teaching beliefs, perceptions of Technological Pedagogical Content Knowledge (TPACK) and teaching self-efficacy. Thus, the aim of this study was to verify a proposed structural model including the three constructs by Structural Equation Modelling (SEM).

2. Literature Review

2.1 Teaching Beliefs

In terms of "teacher belief" was a complex cognitive process in education (Summers et al., 2017). Teachers' beliefs guided teachers' teaching behaviors, while teaching beliefs and teaching behaviors

were closely related and inseparable. Teacher beliefs could be divided into two types (Lim & Chai, 2008). One was teacher-centered. We called it traditional teaching beliefs. It was characterized by knowledge dissemination and teacher decided how to conduct the class. The other was Student-centered constructivist teaching beliefs in which students were responsible for their own learning, constructing knowledge and learning together. Therefore, the role of teachers had changed from primary to guiding in the classroom (Meirink, Meijer, Verloop, & Bergan, 2009; Norton et al., 2005).

Teachers' teaching beliefs would change with the teaching methods and teaching objectives. Teachers' beliefs formed a subjective reality in the classroom; what they believed was a real experience and their teaching beliefs guided their decision-making, behavior and interaction with students. They were achieving teaching goals together (Summers et al., 2017).

Therefore, when teachers were expressing their teaching beliefs, teachers should understand their teaching objectives. Teachers could achieve consistency between teachers' beliefs and teaching objectives through their reflection in the classroom, especially to language teachers' beliefs (Farrell & Ives, 2015).

2.2 Technological Pedagogical Content Knowledge (TPACK)

TPACK was based on the PCK model (Shulman, 1987), Technological related pedagogical content knowledge abbreviated as TPACK, including Content Knowledge [CK], Pedagogical Knowledge [PK] and Pedagogical Content Knowledge [PCK] and Technological Knowledge [TK], Technological Pedagogical Knowledge [TPK], Technological Content Knowledge [TCK] and Technological Pedagogical And Content Knowledge [TPCK] (Mishra & Koehler, 2006).

First, teachers determined how they taught subject content knowledge (PCK) and then considered what technology to use; Second, the integration of technology into the subject content, it was integrated to help teachers transfer the content of teaching to students, so students could understand the subject content. In the classroom, teacher could effectively combine technology with PCK (Technological related pedagogical content knowledge) and solve the complexities that may face in teaching activity. Many studies had shown that TPACK was widely used in various fields and could achieve teaching goals and teaching results. This showed that TPACK was an important concept in the teaching process.

2.3 Teaching self-efficacy

The teacher self-efficacy (TES) was Rotter's (1966) attribution-based control theory. Rotter conceptualized control as a general expectation of controlling an individual's reinforcement relative to its environment development (eg, Rotter, 1966). There were many studies on teacher self-efficacy (Klassen, Tze, Betts, & Gordon, 2011), and these studies showed that teachers were with self-efficacy could enhance students' learning through teaching plan (Zee & Koomen, 2016).

TSE included the expectation of self-efficacy and general outcomes. The former referred to the belief that an action leaded to the desired result; the latter referred to the belief that the individual had the skill to obtain results. Therefore, the TSE divided into two types: high and low performance. Teachers were with high performance were positive for students' performance and learning. Teachers and students would participate in classroom activities, achieve goals, and have a sense of self-fulfillment with positive; on the contrary, teachers were with lower performance were negative to students' learning and behavior. Teachers' goal was inconsistent with students. Teachers decided by themselves, students were frustrated with teaching (Ashton 1984).

We posed the following research questions:

1.What is the validity of the questionnaires for measuring the three constructs (i.e.

teaching beliefs, perceptions of Technological Pedagogical Content Knowledge (TPACK) and teaching self-efficacy)?

2.What are the relationship between the three constructs?

3. Methodology

3.1 Participants

There were totally 200 participants, male were 32 and female were 168. They were presently in-service teachers of teaching Chinese as a second language (TCSL) in Taiwan. Their average age were 35 years old. Their educational backgrounds of the participants were 66 Bachelor's degrees, 118 Master's degrees, and 16 Doctoral degrees. Totally, 153 majored in Teaching Chinese as a Second Language Department, 14 majored in Chinese Department, and 33 in different major, including English, Education, Foreign Languages Department and so on.

3.2 Instrument

In this study, three questionnaires, including Teacher's Teaching beliefs (TTB), Teachers' perceptions of Technology-related Pedagogical Content Knowledge (TPACK) and Teachers' Teaching Self-Efficacy (TTSE). The three questionnaires were filled out at the same time.

The first questionnaire was the Teacher's Teaching Beliefs (TTB). It was divided into two dimensions which were the traditional and constructivism beliefs. There were two examples of Traditional Beliefs (TB) and Constructivist Beliefs (CB). The two dimensions were sample as follows:

Traditional Beliefs (TB): Teacher decided how to conduct the class, it is a teacher-centered class. Sample item: 'Teaching is to explain, demonstrate and guide students to learn'

Constructivist Beliefs (CB): Students were responsible for their own learning, constructing knowledge and learning with teacher, it is a student-centered class. Sample item: 'Teaching should be sufficiently varied and adjusted to match individual differences. '

The second questionnaire had three dimensions, mainly to understand the teachers' perceptions of Technology-related Pedagogical Content Knowledge (TPK/TCK/TPCK). The following were three examples of technology related Pedagogical Knowledge (PK), Content Knowledge (CK) and Pedagogical Content Knowledge (PCK). The two dimensions were defined as follows:

Technological Pedagogical Knowledge (TPK): Teacher integrated technology into teaching. Sample item : ' I can use technology to support Chinese language teaching, such as Application (APP), computer, visual aids and so on';

Technological Content Knowledge (TCK): Teacher knows how to search for multimedia resources. Sample item : ' I was able to search for multimedia materials related to learning Chinese language, for example, the films or movies from YouTube Channels or web resources to learning Chinese'

Technological Pedagogical Content Knowledge (TPCK): Teacher can combine pedagogical content knowledge with technology. Sample item: 'I know how to combine pedagogical content, teaching methods with technology. '

The third questionnaire was about teachers' teaching self-efficacy which includes Teaching self-efficacy (TSE), Subject content self-efficacy (SCE) and Teaching outcome expectancy (TOE). The three dimensions were defined as follows:

Teaching self-efficacy: Teachers have skills to help students learn Chinese. Sample item: 'I can help students reflect on learning outcomes by themselves.'

Subject content self-efficacy: Teachers can affirm their teaching professional ability. Sample item: 'I have full confidence with the Chinese language course that I taught.'

Teaching outcome expectancy: Teachers can improve the students' learning effectiveness. Sample item: 'Teachers always play an important role for the success of Chinese language learning.'

3.3 Data analysis

In this study, the Confirmatory Factor Analysis (CFA) with all of the items and dimensions of the three questionnaires (teacher's teaching beliefs, teachers' perceptions of TPACK and teachers' teaching self-efficacy) included in one model was performed to clarify the reliability and validity of all of the questionnaires. Moreover, to further understand the relationships among the dimensions of these three questionnaires, correlation analysis and SEM were performed.

4. Result

4.1 Verification of the validity of the three questionnaires

A total of 38 items were retained in the version (i.e. 10 items for Teachers' Belief, 14 items for TPACK, and 14 items for TSE). It shows the results of the confirmatory factor analysis for the three questionnaires in one model as well as the descriptive statistics for each variable. Each dimension has four to five questions. The goodness of fit of the structure, Chi-square = 628.887, P < .001, degree of freedom = 283, GFI = .80, IFI = .88, TLI = .86, CFI = .87, RMSEA = .078, and RMR = .069 were obtained, thus confirming the convergent and construct validity of this model for these three questionnaires.

4.2 The structural relationships among teachers' teaching beliefs, perceptions of Technological Pedagogical Content Knowledge (TPACK) and teaching self-efficacy

Figure 1 shows the structural relationships among the three questionnaires: TTB, TPACK, and TTSE. The goodness of fit of the structure, Chi-square = 628.887, P < .001, degree of freedom = 283, GFI = .80, IFI = .88, TLI = .86, CFI = .87, RMSEA = .078, and RMR = .069 were obtained, thus confirming the convergent and construct validity of this model for these three questionnaires.
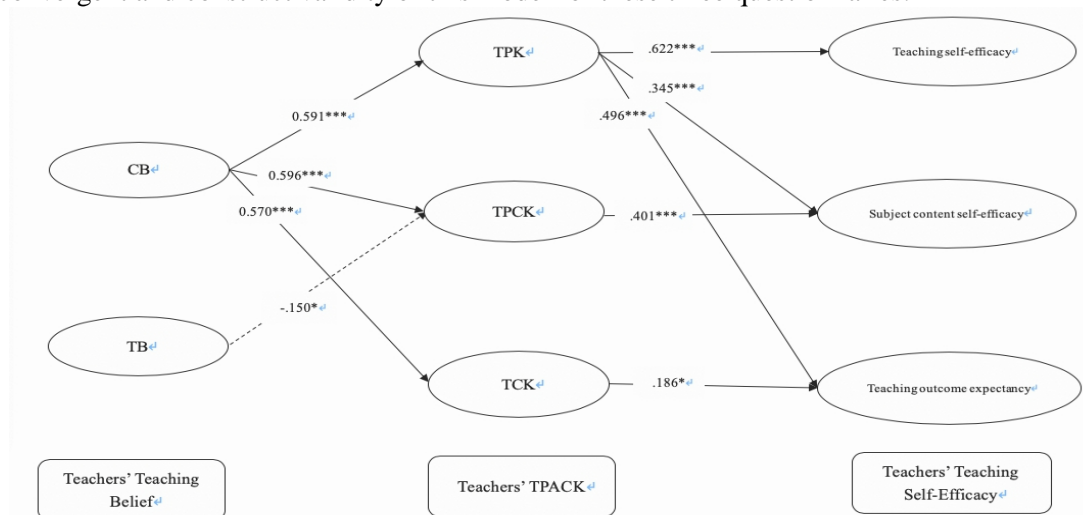

Figure 1. The structural equation model of the relationships among TB, TPACK and TSE.

According to Figure 1, 'TB' is the significantly negative dimension for explaining the variation in reproductive all Teachers' TPACK (path coefficient =−.150, P < .05), whereas 'CB' is the significantly positive dimension explaining the variation in all Teachers' TPACK (TPK's path coefficient = .59, P < .001; TPCK's path coefficient = .60, P < .001; TCK's path coefficient = .57, P < .001). In addition, "TPK" is the is the significantly positive dimension explaining the variation in all Teachers' Teaching Self-Efficacy (Teaching self-efficacy's path coefficient = .62, P < .001; Subject content self-efficacy's path coefficient = .35, P < .001; Teaching outcome expectancy' s path coefficient = .50, P < .001); On the other hand, 'TPCK' is the significantly positive dimension only can predict the Subject content self-efficacy(path coefficient = .40, P < .001) and 'TCK' is the significantly positive dimension only can predict the Teaching outcome expectancy (path coefficient = .19, P < .05).

5. Discussion

All in all, the result indicated that the teachers with constructivism belief tended to have more perceptions of all the Teachers' TPACK; on the contrary, the teachers with traditional belief showed that they tended to have fewer perceptions toward TPCK. Furthermore, it was found that teachers' TPK could positively predict all of their teaching self-efficacy; their TPCK could positively predict their subject content self-efficacy and their TCK can positively predict their Teaching outcome expectancy. There was a positive relationship between TCSL teachers' constructivism belief and their

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