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THINKING STYLES OF PRIMARY SCHOOL TEACHERS IN BEIJING, CHINA

Abstract

Previous studies on teachers' thinking have usually related to teaching and learning, and concentrated on classroom-level outcomes. In this study, an organizational and administrative perspective was adopted in examining teachers' thinking style. Data collected were from a sample of 268 in-service teachers from 6 primary schools in Beijing, China. An instrument, the Thinking Styles Questionnaire for Teachers (TSQ-T), was developed to assess the teachers' thinking styles. The results of the study showed that (a) the TSQ-T is a reliable and valid inventory for assessing the thinking styles of primary school teachers in Beijing, with the subscales' Cronbach's alphas ranged from .60 to .84; (b) the dominant thinking styles among the teachers were cooperative, hierarchical, and analytical; and (c) there were significant differences in teachers' thinking styles in terms of gender, teaching experience, rank, discipline background, and executive position. Implications for work design, building school culture, teachers' professional training and development, and the development of professional learning community were discussed in the context of educational reform and the ever changing environment.

Keywords: thinking style, educational leadership, primary school, teacher, Beijing

Introduction

Thinking style is a term used in cognitive psychology to describe the "consistent individual differences in preferred ways of organizing and processing information and experience" (Messick, 1976, p. 4). There are other terms such as "cognitive style" (Riding, 1991) or "learning style" (Kolb, 1976) used by different scholars. Though there are some distinctions in these terms (Yeap & Chong, 1997; Peterson, Rayner & Armstrong, 2009; Evans & Cools, 2011), thinking style (or intellectual style), as agreed by many contemporary researchers, refers to people's preferred ways of processing information and dealing with tasks (Sternberg, 1997; Zhang & Sternberg, 2005; Hunt, 2008).

The development of thinking style research is an interesting and paradoxical topic, which has been constantly searching for its identity within the larger context of educational, psychological, and business literature. Empirical studies have shown that differences in thinking styles influence almost all activities that implicate cognition in multiple and important ways, including learning, problem solving, decision making and communication. It is found that thinking style can be a better predictor of an individual's success in a particular situation than general intelligence or situational factors (Kozhevnikov, 2007). In the field of organizational psychology, thinking style is considered to be a fundamental factor affects both individual and organizational behaviour (Talbot, 1989; Sadler-Smith & Badger, 1998) and an important variable in recruitment, internal communications, and conflict management (Hayes & Allinson, 1994).

In the field of educational research, there are many studies that focus on students' learning style, teachers' teaching style, and the interaction style between teachers and students (Zhang, 2011). Evidence has shown that teacher's thinking styles make a difference to students' learning and development, teaching behaviours, as well as in the interaction between students and teachers. Actually, teachers' thinking was highlighted by some scholars as a central factor to school reform (Woodbury & Gess-Newesome, 2002). "Educational change depends on what teachers do and think—it is as simple and as complex as that" (Fullan, 1991, p. 117). Educational reform becomes complex because what teachers do is greatly influenced by what teachers think (Clark & Peterson, 1986). It is common that "there are so much reform, but so little change" (Payne, 2008, p. i). There are so many ineffective reform strategies and policies, because they do not get deep enough into the hearts and minds of teachers (Fullan, 2009, p. 4). Many educational reforms have failed, because little change has occurred in teachers' ways of thinking. Successful educational reform is only possible, when teachers' ways of thinking have changed and adapted to the new paradigms that is requested in the reform. In the literature, most researchers have focused on the contributions of thinking styles to students' academic achievement at the classroom level (Zhang & Sternberg, 1998; 2002), while few researchers takes an administrative perspective to examine teachers' thinking styles at the school level. Therefore, we are dedicated to investigate teachers' thinking styles from an organizational and administrative perspective and to examine their relations to school improvement and school effectiveness.

Theoretical Framework

It has been quite diverse in the conceptualization of thinking styles and approaches of investigation into the very meanings of them. There are various theories and tools of thinking styles, which have made the "choice of appropriate measures by practitioners increasingly difficult" (Evans & Waring, 2009, p. 173). Zhang (2011) has summarized and briefly introduced several influential integrative thinking models. These provide us a good understanding the conceptualization of thinking styles, cognitive styles, learning styles or intellectual styles. Curry's "onion" model of learning styles (1987) has outlined thinking styles into three layers resembling an onion with personality dimension the innermost, information processing dimension the middle, and individuals' instructional preferences the outermost. Miller (1987) has provided an integrated model of cognitive styles, which subordinates all styles to analytic-holistic dimensions. Riding and Cheema's (1991) have conceptualized a model of cognitive styles which classifies thinking styles into two dimensions: holistic-analytic and verbal-imagery. Grigorenko and Sternberg's (1995) model categorizes thinking styles to three traditions: cognition-centred, personality-centred, and activity-centred. Zhang and Sternberg's (2005) threefold model, which classifies intellectual styles into three types (type I, type II and type III), according to the dimensions of preferences: high degrees of structure versus low degrees of structure, cognitive simplicity versus cognitive complexity, conformity versus nonconformity, authority versus autonomy, and group versus individual work (Zhang & Sternberg, 2005). Sadler-Smith (2009) has provided a duplex model of cognitive style, which is based on the dual-process theory and sorted thinking styles with intuitive-analytic dimension. These different conceptions

and integrated models have provided us a good understanding of thinking styles and a good reference to guide this study.

This study has adopted Zhang and Sternberg's (2005) threefold model of thinking styles in devising an instrument for assessing teachers' thinking styles. However, the threefold model of intellectual styles has some drawbacks. The most obvious problem is none of the three thinking styles can be operationalized and turned into measurable variables. Additionally, it is hard to distinguish conformity from authority clearly in the conceptualization. That is there might be overlapping in their meanings among the three types of thinking styles, to some extent. There is evidence from Black's (2008) study, which based upon 789 students in a sample, demonstrated that the threefold model inventory has an unsatisfied validity. Anyway, based on the aforementioned models, we attempted to adopt and develop some of the concepts and form our own framework of thinking styles. We conceptualize that a model of teachers' thinking styles will contain five dimensions as: conformity versus nonconformity, high degrees of structure versus low degrees of structure, cognitive simplicity versus cognitive complexity, group versus individual work, and task-oriented versus relation-oriented. This study was conducted as a pilot study to test the validity of our model of thinking styles and to validate a newly created instrument with a sample of teachers from some primary schools in Beijing, China.

Aims of the Study

The aims of this are three folds. The first was to develop and validate an instrument to assess teachers' thinking styles, which is entitled as the Thinking Styles Questionnaire for Teachers (TSQ-T). The second was to explore the characteristic of thinking styles among a group of primary teachers from the schools in Beijing, China. The third was to examine how thinking styles vary with teachers' demography. Based on the above research purposes, this study was guided by the following three research questions:

1. Is the Thinking Styles Questionnaire for Teachers (TSQ-T) a valid and reliable instrument to assess teachers' thinking styles?
2. What are the characteristics of teachers' thinking styles in Beijing primary schools?
3. How do thinking styles vary with teachers' demographic variables?

Methodology

The instrument

An instrument, the *Thinking Styles Questionnaire for Teachers* (TSQ-T), was developed to assess teachers' thinking style from an organizational and administrative perspective. Four major studies have inspired the authors to create the theoretical framework and therefore the instrument that was generated from the framework. They were (i) Myers-Briggs's Type Indicator (MBTI, Myers, 1980), (ii) Kirton's Adaption-Innovation (KAI) theory (Kirton, 1989), (iii) the Cognitive Style Index (CSI, Allinson & Heyes, 1996), and (iv) the Thinking Styles Questionnaire for Teachers (TSQT, Grigorenko & Sternberg, 1993). The TSQ-T was adopted and developed from these references, because they have (i) a strong theoretical base, (ii)

high validity and reliability in their tools of measurement, (iii) been empirically based and tested, and (iv) been related to organizational behaviour.

Data collection

The initial instrument was constructed with 75 items in various subscales designed according to the theoretical framework. The sampled teachers were asked to rate each of the items in the Thinking Styles Questionnaire for Teachers (TSQ-T) on a 6-point Liker-type scale ranging from 1 (very dissimilar) to 6 (very similar). The teachers were also asked to indicate their demography in terms of gender, professional rank, teaching experience, major subject in teaching, and administrative position.

Subjects

312 teachers from six primary schools in Beijing, China were invited to take part in this study. All the six primary schools were involved in a school improvement project organized by a university. Three schools were high performing schools, while the other three were relatively low-performing. 268 valid questionnaires were obtained, which resulted a response rate of 85.9%. Among these teachers, 213 were female, and 25 were male, which was close to the population distribution, in which most teachers were female in urban primary schools in Beijing.

Data analysis

According to the theoretical framework we hypothesized, there are five major scales of thinking styles, that is, (i) conformity versus nonconformity, (ii) high degree of structure versus low degree of structure, (iii) cognitive simplicity versus cognitive complexity, (iv) group work versus individual work), and (v) task focused versus relationship focused. Within each of the major scales, there were two subscales. Principal component analysis (PCA) with oblimin rotation was conducted to each of five major scales separately. The results of factor analysis confirmed the existence of the two subscales in each of the five scales. Therefore, we concluded that the TSQ-T was a valid inventory for assessing teachers' thinking styles. A final version of the TSQ-T, with 37 valid items in five major scales and ten subscales of thinking styles, was resulted. The developed ten subscales of thinking styles were: (i) Innovative vs Conventional (from the scale of conformity versus nonconformity); (ii) Hierarchical vs Linear (from the scale of high degree of structure versus low degree of structure); (iii) Intuitive vs Analytical (from the scale of cognitive simplicity versus cognitive complexity); (iv) Independent vs Cooperative (from the scale of group versus individual work); and (v) Task-oriented vs Relation-oriented (from the scale of task focused versus relationship focused). Repeated reliability tests were also conducted in data analyses, in order to select the valid items in the construct and to examine its reliability. The Cronbach alpha coefficients for the ten subscales ranged from 0.60 to 0.84. The findings of this study show that the reliability coefficients on average were higher than other instruments in thinking style studies (Coffield, Moseley, Hall & Ecclestone, 2004). Hence, the TSQ-T demonstrated a good reliability, which allowed us to perform the remaining statistical analyses.

Results

Results from a descriptive analysis indicated that, among these ten subscales of thinking styles, the cooperative thinking style was most commonly held, while the task-oriented thinking style was the least. The dominant thinking styles among the teachers were cooperative, hierarchical, and analytical. Besides, both linear thinking style and task-oriented thinking style had a wide distribution, which suggested great variations among teachers. These results seemed to be consistent with teachers' work nature which requires great opportunity of cooperation in team work; when occupied with lots of work, they tend to prioritize tasks in order; and they tend to handling and solving many problems in daily routine.

ANOVA tests were conducted to examine the variations of the ten subscales of thinking styles with the teachers' demographic variables. The major findings of these ANOVA tests are described and discussed as below.

First, male teachers scored higher on the innovative thinking style than did their female counterparts. This result suggests that, when compared with female teachers, male teachers may be more likely to challenge the rules and regulations and routines set by the school authorities and they tend to initiative new and creative ways in their educational practice. This finding was consistent with some previous cognitive and neuropsychological research on gender differences. However, this finding is contradictory with Zhang and Sternberg's (2002) finding that male teachers were more conventional. In sum, this study has provided evidence that there was indeed gender difference in thinking styles.

Second, both innovative thinking style and intuitive thinking style varied significantly with an increasing teaching experience. Teachers, who had more teaching experience, might have been exposing to a greater variety of situations and challenges. They were more able to respond to these challenges rapidly, practically and creatively. This result is consistent with Zhang's (1999) study that rich experiences had positive effects on people's thinking.

Third, senior teachers had better performance in cooperative thinking style and task-oriented thinking style than did junior teachers. Senior teachers were more competent and skilful in working collaboratively as well as working with high efficiency.

Fourth, teachers taught Chinese were more likely to use relation-oriented thinking style than teachers who taught English. The different cultures behind the two languages may be a plausible explanation of this result. Teachers who taught English may had more connections with Western culture, while teachers taught Chinese were influenced more deeply by the Confucian culture, in which, relationship plays an important role.

Fifth, there were significant differences between school top leaders and teachers in hierarchical thinking style and analytical thinking style. This result seemed to be consistent with our common knowledge that leaders and managers, who have to shoulder more responsibility for school administration and development, would have a stronger analytical mind and have thorough consideration in decision-making.

Discussion and Implication

This research has three significant contributions. First, an instrument, the Thinking Styles Questionnaire for Teachers (TSQ-T), has been developed and validated in the context of Chinese schools in Beijing and it will be useful to assess teachers' thinking styles in the workplace. Secondly, this study has contributed to the literature concerning teachers' thinking styles from an organizational and administrative perspective. Thirdly, the covariance between thinking styles and teachers' demography has been proved. The significant findings about gender difference in thinking styles and variation in the pattern of thinking styles with different teaching experience were consistent with previous research. In addition, this study has explored the variation of thinking styles with other new demographic variables, for example, professional ranks, subject background, and administrative position. Such findings allow us to have a better understanding of cognitive science and teachers' behaviour with the school organization. While, previous studies usually equate teacher's thinking style to teaching style, in the present study, we conceptualize teacher's thinking styles from an organizational and administrative perspective. This new approach of research will make the following recommendations for school improvement possible.

Work design. The present educational reform in China continuously renders the school system highly decentralized, in which teachers are facing more and more challenges. Therefore, school leaders and managers should not only understand their own ways of thinking, but also the thinking styles of teachers. Thinking styles varies from teacher to teacher and from situation to situation. If an individual's thinking style matches the information-processing requirements of his or her role or task, it is more likely that the individual will perform more effectively (Hayes & Allinson, 1994). Therefore, in work design or task assignment, particular attention should be paid to thinking style differences by school leaders and managers. Correspondingly, teachers should consider the matching of thinking styles in job selection.

School culture. A study of Kirton (1980) suggests that the match between thinking style and the local organizational environment may be a factor which helps determine which department employees prefer to work in, which implies a correlation between thinking fit and job satisfaction. The findings of this study indicate that teachers prefer an environment which is cooperative and low task-oriented. Hence, in order to enhance teachers' job satisfaction and sense of belongingness, school leaders and managers should dedicate themselves to building such environment to fit teachers' thinking. Furthermore, if creative thinking is seen to be more risky and less acceptable in a bureaucratic organization (Kirton, 1980), school leaders should make use of cultural linkage to bind people together and to conceal the dangers and risks arisen from creativity (Pang, 2003).

Teachers' professional development. Think styles can be socialized and modified (Zhang & Sternberg, 2006). Therefore, teachers who are at the senior positions and who have more teaching experience will have better performance in particular thinking styles. This implies that the setting of certain contexts in the workplace may allow teachers to practice, develop and master the thinking styles that are required in specific positions or expected by playing appropriate roles. This will enhance the quality and effectiveness of professional development programmes for teacher training.

Professional learning community. Thinking and learning are the two sides of a coin. Teachers' learning may mean a change in the ways of thinking in the teachers' mind. When groups of teachers interact and change in thinking styles collectively, they would form a professional learning community. Research evidence shows that the behaviour and effectiveness of teams are dependent upon the levels of homogeneity and heterogeneity of thinking styles of team members (Priola, Smith & Armstrong, 2004). Though members in a community with homogeneity might feel more comfortable, the group with heterogeneity in thinking styles was essential to change and creativity (Armstrong, Heijden & Smith, 2012). Therefore, when leading a professional learning community, different thinking styles need to be taken into account.

A few limitations in this study should be noted. First, our framing of the questions and the literature review are inspired by research studies from the western culture and perspective; yet, our subjects are Chinese teachers, hence, the results and implications may need to be considered in the cultural contexts. Furthermore, as we relied on teachers' self-reporting information, there might be problems of social desirability, where teachers might report the desired thinking styles. Thus, subsequent empirical research that uses multiple and more robust measures is needed. Additionally, the study only investigated primary school teachers in Beijing, China. Therefore, caution must be exercised in attempting to generalize these results to other schools or contexts.

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